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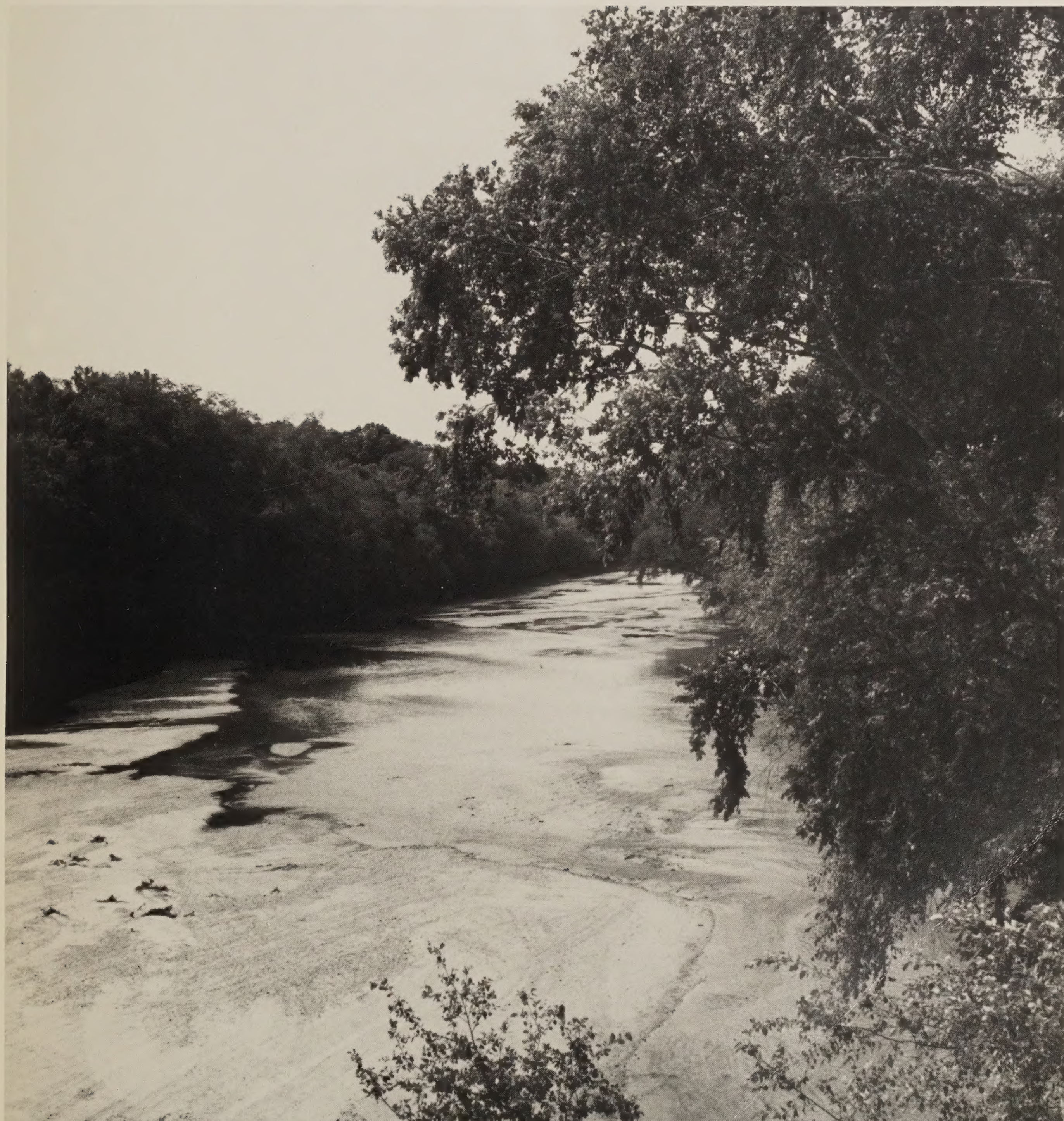
Soil Survey of Franklin County, Mississippi



How To Use This Soil Survey

General Soil Map

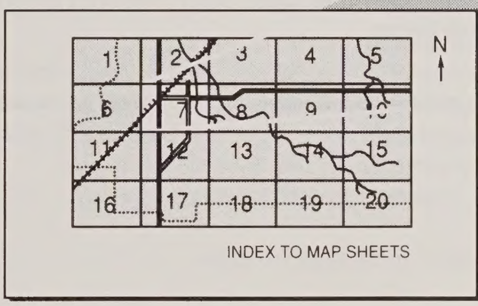
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

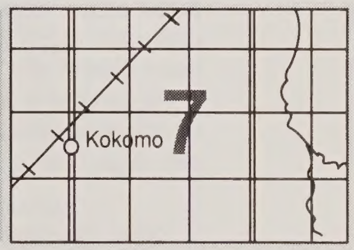
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

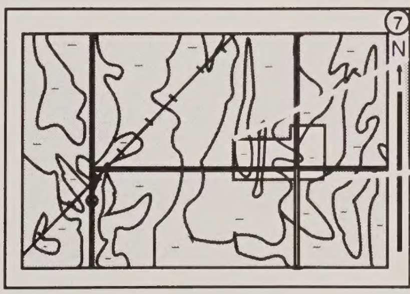


INDEX TO MAP SHEETS



MAP SHEET

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



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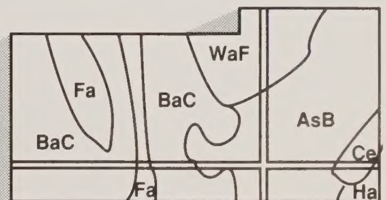

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1987. Soil names and descriptions were approved in 1987. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1987. This soil survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Franklin County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: The Homochitto River provides opportunities for many kinds of recreational activities in Franklin County.

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Foreword

This soil survey contains information that can be used in land-planning programs in Franklin County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow over bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Homer L. Wilkes
State Conservationist
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Soil Survey of
Franklin County, Mississippi

By William M. Morris, Jr., Soil Conservation Service

Fieldwork by William M. Morris, Jr., Thomas T. Kilpatrick, and A.C. Milbrandt, Soil Conservation Service, and Jarrell Austin, Forest Service

United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with
the Mississippi Agricultural and Forestry Experiment Station

Franklin County is in the southwestern part of Mississippi (fig. 1). It has an area of about 362,600 acres, or about 566 square miles *(25)*. The population of the county is about 8,208, and that of Meadville, the county seat, is about 575 *(16)*.

The county is bounded on the east by Lincoln County, on the north by Lincoln and Jefferson Counties, on the west by Adams County, and on the south by Wilkinson and Amite Counties. At its longest and widest points, Franklin County extends about 31 miles from east to west and 20 miles from north to south. The western one-third of the southern boundary is the Homochitto River, which separates Franklin County from Amite and Wilkinson Counties. The major streams flow mainly to the south. Much of the runoff drains into the Homochitto River, which is a tributary of the Mississippi River. A small acreage in the southeastern part of the county drains into the Amite River.

Soil scientists have mapped 32 different kinds of soils in Franklin County. The soils vary widely in texture, natural drainage characteristics, and other properties.

Corn, soybeans, wheat, forest products, and beef and dairy cattle are the main sources of agricultural income in Franklin County *(15)*.

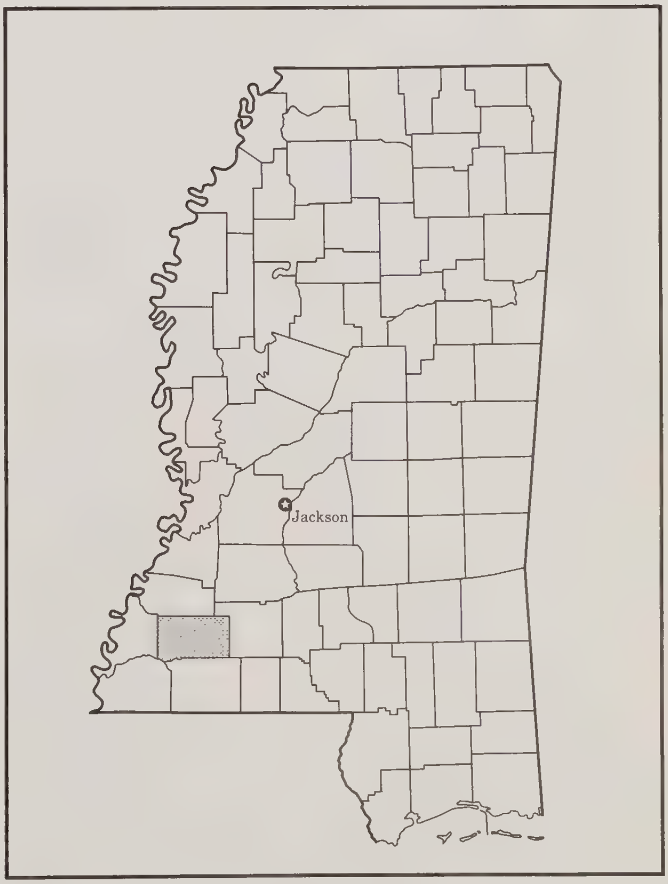

Figure 1.—Location of Franklin County in Mississippi.

General Nature of the County

This section gives general information about Franklin County. It briefly describes climate, history and development, physiography, and agriculture.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Liberty, Mississippi, in the period 1951 to 1981. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 49 degrees F and the average daily minimum temperature is 36 degrees. The lowest temperature on record, which occurred at Liberty on January 12, 1962, is 5 degrees. In summer, the average temperature is 80 degrees and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred on June 30, 1969, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 58 inches. Of this, about 30 inches, or about 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 23 inches. The heaviest 1-day rainfall during the period of record was 7.85 inches at Liberty on April 21, 1977. Thunderstorms occur on about 64 days each year.

Snowfall is rare. In 95 percent of the winters, there is no measurable snowfall. In 5 percent, the snowfall, usually of short duration, is less than 1 inch. The heaviest 1-day snowfall on record was about 3 inches.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest in spring.

History and Development

The area now known as Franklin County was a part of the Natchez District during the 18th century *(13)*. Franklin County was organized in 1809. The original area of the county was much larger than it is today, but several counties were created entirely or partly from the partition of the original county area *(5)*. Land for the county courthouse and for the town of Meadville was donated to the county in 1822 *(5)*.

A few settlers came to the county during the period of French occupation. England made several large land grants to formal officials during the period of English occupation *(12)*. The first census was conducted in the county in 1800. It showed a total population of 462 *(12)*. About 12 years later, the population had increased to 1,995, and by 1820 it had increased to 3,817 *(12)*. Most of the later immigrants came from the Carolinas and Georgia. The chief occupation of these immigrants was farming *(12)*.

The county has two industrial plants that are not related to the agricultural industry. One of these plants produces clothing, and the other one builds and repairs railroad cars. Four wood-products plants are near the communities of Bude and Roxie.

Physiography

The landscape of Franklin County includes high, rugged hills with steep hillsides that are broken by level strips of bottom land along the rivers and creeks. Most of the survey area is drained by the Homochitto River, which divides the county into roughly equal eastern and western parts. A smaller area in the extreme southeast corner drains into the Amite River.

The topography of Franklin County ranges from nearly level on the flood plains to very steep in the uplands. The elevation is more than 500 feet above sea level in small, very hilly areas of the north-central and southeastern parts of the county. The lowest point in the county, less than 100 feet above sea level, is in the southwest corner along the Homochitto River.

Agriculture

Farming has always been an important part of the economy of Franklin County. The chief crops grown by the early settlers were indigo and tobacco. Later, cotton became the principal crop. Since about 1937, however, the emphasis in farming has changed from cotton to sod crops, forest products, and livestock. In recent years the acreage used for soybeans or corn has steadily increased *(26)*.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface

down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this soil survey do not fully agree with those of the soils in surveys of adjacent counties. Differences are the result of a better understanding of the soils, modifications in series concepts, and variations in the intensity of mapping or in the extent of the soils within the survey areas.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral

patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Each map unit is rated for *cultivated crops, pasture, woodland, urban uses,* and *wildlife habitat.* Cultivated crops are those grown extensively in the survey area. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments and septic tank absorption fields. Wildlife habitat includes that for openland wildlife, woodland wildlife, and wetland wildlife.

1. Gillsburg-Ariel-Oaklimeter

Nearly level, silty, somewhat poorly drained, well drained, and moderately well drained soils; on flood plains

These soils are on flood plains throughout the county. The nearly linear surface of the flood plain is broken by old runs, natural levees, sloughs, chutes, and scarps. The soils are occasionally flooded, generally in winter or early spring. Slopes range from 0 to 2 percent.

This map unit makes up about 6 percent of the county. It is about 41 percent Gillsburg soils, 22 percent Ariel soils, 20 percent Oaklimeter soils, and 17 percent minor soils.

Gillsburg soils are somewhat poorly drained. They formed in silty alluvium on broad flood plains. Typically, the surface layer is dark grayish brown silt loam. The upper part of the subsoil is silt loam that is mottled in shades of gray and brown. The lower part is light brownish gray silt loam that has mottles in shades of brown.

Ariel soils are well drained. They formed in silty alluvium on broad flood plains and natural levees near streams. Typically, the surface layer is dark brown silt loam. The upper part of the subsoil is dark yellowish brown, and the lower part is mottled in shades of brown and gray.

Oaklimeter soils are moderately well drained. They formed in silty alluvium on broad flood plains near streams. Typically, the surface layer is brown silt loam. The upper part of the subsoil is yellowish brown silt loam that is mottled in shades of brown and gray. The lower part is light brownish gray silt loam that has mottles in shades of brown.

Of minor extent in this unit are the excessively drained Bruno and moderately well drained Collins soils on flood plains and the poorly drained Trebloc soils on broad flats, stream terraces, and flood plains.

This map unit is used mostly as woodland or pasture. The soils are well suited to these uses. A small acreage is used as cropland. Flooding in winter and early spring is a hazard in areas used for crops.

The soils in this map unit are well suited to woodland. Productivity is high for bottom-land hardwoods. Equipment use is limited because of the flooding.

The soils in this map unit are severely limited as sites for urban uses because of the flooding. Wetness and the flooding are limitations on sites for septic tank absorption fields and subsurface waste-water disposal systems.

The soils in this map unit have good potential for use as habitat for openland wildlife and woodland wildlife. Gillsburg soils have fair potential for use as habitat for wetland wildlife, Oaklimeter soils have poor potential, and Ariel soils have very poor potential.

2. Smithdale-Loring

Nearly level to steep, well drained, loamy soils and moderately well drained, silty soils that have a fragipan; on uplands

These soils are mainly in the central, west-central, and north-central parts of the county. The landscape is characterized by sloping to steep hillsides and nearly level to sloping hilltops that are generally less than one-fourth mile wide. The area is dissected by many short drainageways and by narrow flood plains. Slopes range from 0 to 40 percent.

This map unit makes up about 19 percent of county. It is about 53 percent Smithdale soils, 36 percent Loring soils, and 11 percent minor soils.

Smithdale soils are on sloping to steep hillsides and are well drained. They formed in loamy material. Typically, the surface layer is dark brown sandy loam. The subsoil is red sandy clay loam in the upper part and red loam in the lower part.

Loring soils are on nearly level to sloping uplands and are moderately well drained. They formed in silty material. They have a fragipan. Typically, the surface layer is dark brown silt loam. The subsoil is yellowish brown silt loam. The fragipan is mottled yellowish brown, pale brown, light gray, and light brownish gray silt loam.

Of minor extent in this unit are the moderately well drained Providence soils on ridgetops, the moderately well drained Oaklimeter soils on flood plains, and the well drained Memphis soils on the higher ridgetops.

Most of the acreage in this unit is used as woodland, but the nearly level and gently sloping areas of Loring soils are used mainly for crops and pasture. Smithdale soils are poorly suited to crops and pasture because of the slope and a severe hazard of erosion.

These soils are well suited to woodland. Smithdale soils have only slight limitations that affect woodland management. On the steeper slopes, the equipment limitation is moderate. Wetness is a moderate limitation affecting the use of equipment in areas of Loring soils. Plant competition is severe.

The steeper areas of Smithdale soils are severely limited for urban uses because of the slope. The wetness is a moderate limitation affecting urban uses in areas of Loring soils. Also, the fragipan is a limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems.

These soils have good potential for use as habitat for woodland wildlife. They generally have good potential for use as habitat for openland wildlife, but the potential is only fair in areas where slopes are more than about 17 percent. The potential for use as habitat for wetland wildlife is very poor.

3. Lorman-Smithdale

Sloping to steep, moderately well drained, clayey soils and well drained, loamy soils; on uplands

These soils are mainly in the central, south-central, and southwestern parts of the county. The terrain is very hilly and rugged. The landscape is characterized by narrow hilltops, generally less than one-eighth mile wide, and by steep hillsides. The drainage pattern is dendritic, and many short drainageways dissect the hillsides. Narrow flood plains extend into areas of this unit. Slopes range from 5 to 40 percent.

This map unit makes up about 15 percent of the county. It is about 52 percent Lorman soils, 25 percent Smithdale soils, and 23 percent minor soils.

Lorman soils are on hillsides and are moderately well drained. They formed in layered marine sediments that have a high content of clay and silt. Typically, the surface layer is very dark grayish brown silt loam. The upper part of the subsoil is yellowish red clay and silty clay that has stains and mottles in shades of brown, red, and gray. The next part is silty clay loam that is mottled in shades of brown, red, and gray. The lower part is light brownish gray silty clay loam that has mottles in shades of red. The underlying material is light brownish gray, soft, thinly bedded silt with laminae of silt loam, silty clay loam, and weakly indurated siltstone and clay.

Smithdale soils are generally on the upper and steeper parts of hillsides and are well drained. They formed in loamy material. Typically, the surface layer is dark brown sandy loam. The subsoil is red sandy clay loam in the upper part and red loam in the lower part.

Of minor extent in this unit are the moderately well drained Kolin and Providence soils on ridgetops and the well drained Ariel and somewhat poorly drained Gillsburg soils in drainageways and on flood plains. Providence soils have a fragipan.

This map unit is used mostly as woodland. Some areas are used for pasture or crops. The soils are poorly suited to row crops and to pasture grasses and legumes. The slope, low productivity, and the hazard of erosion are the main limitations.

Lorman soils are moderately suited to woodland, and Smithdale soils are well suited. The slope is a moderate limitation. Because of the clayey texture of the Lorman soils, trafficability is restricted during wet periods.

Because of a high shrink-swell potential and the slope, the potential of these soils as sites for urban development is severely limited. Also, Lorman soils are severely limited as sites for local roads and streets because of low strength.

These soils have good potential as habitat for

woodland wildlife but have very poor potential as habitat for wetland wildlife. They have good potential for use as habitat for openland wildlife in areas where slopes are less than about 15 percent. In the steeper areas, the potential as habitat for openland wildlife is only fair.

4. Smithdale-Lexington-Memphis

Gently sloping to steep, well drained, loamy and silty soils; on uplands

These soils are in a large area in the northwestern part of the county. The terrain is very hilly and rugged. The landscape is characterized by narrow hilltops, less than one-eighth mile wide, and by steep hillsides. The drainage pattern is dendritic, and many short drainageways dissect the hillsides. Narrow flood plains extend into areas of this unit. Slopes range from 2 to 40 percent.

This map unit makes up about 9 percent of the county. It is about 54 percent Smithdale soils, 12 percent Lexington soils, 11 percent Memphis soils, and 23 percent minor soils.

Smithdale soils are on upland hillsides. They formed in loamy material. Typically, the surface layer is dark brown sandy loam. The subsoil is red sandy clay loam in the upper part and red loam in the lower part.

Lexington soils are on narrow upland hilltops and the upper parts of hillsides. They formed in silty material and in the underlying loamy material. Typically, the surface layer is brown silt loam. The upper part of the subsoil is dark brown silty clay loam, the next part is strong brown sandy loam, and the lower part is red sandy loam.

Memphis soils are on upland hilltops and hillsides. They formed in thick deposits of silty material. Typically, the surface layer is brown silt loam. The upper part of the subsoil is dark brown silty clay loam, and the lower part is strong brown silt loam. The underlying material also is strong brown silt loam.

Of minor extent in this unit are the moderately well drained Loring and Providence soils on ridgetops and the well drained Ariel soils on narrow flood plains. Loring and Providence soils have a fragipan.

Most of the acreage in this unit is used as woodland. Many areas of the Lexington and Memphis soils on ridgetops are used for row crops or pasture. The gently sloping areas of Memphis soils are well suited to the crops commonly grown in the county and are well suited to grasses and legumes. The soils in strongly sloping or steep areas are poorly suited to row crops because of the slope and the hazard of erosion. The Smithdale soils on steep hillsides are poorly suited to grasses and legumes.

These soils are well suited to woodland. The slope restricts the use of equipment. If pine trees are planted on the Lexington and Memphis soils, competition from undesirable plants is severe.

These soils generally are severely limited as sites for urban development and for septic tank absorption fields and subsurface waste-water disposal systems because of the slope. Low strength is a severe limitation if the Lexington and Memphis soils are used as sites for local roads and streets. Gently sloping areas of Memphis and Lexington soils have only slight limitations that affect most urban uses.

These soils have good potential for use as habitat for woodland wildlife but have very poor potential for use as habitat for wetland wildlife. They generally have good potential for use as habitat for openland wildlife, but the potential is only fair in areas where slopes are more than about 15 percent.

5. Smithdale-Providence-Saffell

Nearly level to steep, well drained, loamy soils, moderately well drained, silty soils that have a fragipan, and well drained, gravelly soils; on uplands

These soils are in the eastern half of the county. The landscape is characterized by narrow, winding, and branching ridgetops and moderately steep or steep, dissected side slopes. The hilltops are less than one-eighth mile wide. The drainage pattern is dendritic, and steep hillsides are highly dissected by short drainageways. Narrow flood plains extend along the larger drainageways. Slopes range from 0 to 40 percent.

This map unit makes up about 39 percent of the county. It is about 40 percent Smithdale soils, 25 percent Providence soils, 19 percent Saffell soils, and 16 percent minor soils.

Smithdale soils are on hillsides and are well drained. They formed in loamy material. Typically, the surface layer is dark brown sandy loam. The subsoil is red sandy clay loam in the upper part and red loam in the lower part.

Providence soils are moderately well drained and are on narrow upland hilltops and the upper parts of upland hillsides. They formed in silty material and in the underlying loamy material. They have a fragipan. Typically, the surface layer is dark brown silt loam. The upper part of the subsoil is yellowish brown silty clay loam, and the lower part is a fragipan. The upper part of the fragipan is yellowish brown silt loam that has mottles in shades of brown. The next part is yellowish brown silt loam that has mottles in shades of brown and gray. The lower part of the fragipan is strong brown clay

loam that has mottles in shades of brown, red, and gray.

Saffell soils are on upland hillsides and are well drained. They formed in gravelly, loamy and sandy materials. Typically, the surface layer is brown gravelly sandy loam. The upper part of the subsoil is strong brown very gravelly sandy clay loam. The lower part is yellowish red and strong brown very gravelly loam. The substratum is red very gravelly sandy loam.

Of minor extent in this unit are the well drained Ariel soils on flood plains, the moderately well drained Loring soils on upland hilltops, and the moderately well drained Kolin soils on ridgetops. Loring soils have a fragipan.

Most of the acreage in this unit is used as woodland, but many areas of the Providence soils on ridgetops are used for pasture and hay or for row crops. The Smithdale and Saffell soils on the steeper hillsides are poorly suited to row crops and to pasture grasses and legumes. The slope, low productivity, and the hazard of erosion are the main limitations. The nearly level and gently sloping areas of Providence soils on the wider hilltops are well suited to the row crops commonly grown in the county and are well suited to grasses and legumes. The Smithdale and Saffell soils on steep hillsides are poorly suited to grasses and legumes.

Smithdale and Providence soils are well suited to woodland, but Saffell soils are poorly suited because of low productivity. In areas of the Smithdale and Saffell soils where slopes are more than about 15 percent, the use of equipment is restricted. If pine trees are planted in areas of the Providence soils, competition from undesirable plants is a moderate concern.

The steep areas of Smithdale and Saffell soils are severely limited as sites for urban development and for septic tank absorption fields because of the slope. Providence soils are moderately suited to residential and small commercial buildings. Seasonal wetness is a moderate limitation, and the slope is an additional concern. Low strength is a severe limitation if the Providence soils are used as sites for local roads and streets. Wetness and slow permeability in the fragipan are severe limitations affecting septic tank absorption fields and subsurface waste-water disposal systems in areas of the Providence soils.

Smithdale and Providence soils have good potential for use as habitat for woodland wildlife but have very poor potential for use as habitat for wetland wildlife. They generally have good potential for use as habitat for openland wildlife, but the potential is only fair in areas where slopes are more than about 15 percent. Saffell soils have fair potential for use as habitat for woodland wildlife, poor potential for use as habitat for openland wildlife, and very poor potential for use as habitat for wetland wildlife.

6. Providence-Bude-Smithdale

Nearly level to steep, moderately well drained and somewhat poorly drained, silty soils that have a fragipan and well drained, loamy soils; on uplands

These soils are mainly on undulating to rolling uplands throughout the county. The largest area is in the southeastern part of the county. The landscape is dominantly nearly level to strongly sloping and is characterized by steep slopes along incised drainageways. Drainageways are bordered by narrow flood plains. Slopes range from 0 to 40 percent.

This map unit makes up about 12 percent of the county. It is about 53 percent Providence soils, 11 percent Bude soils, 9 percent Smithdale soils, and 27 percent minor soils.

Providence soils are on ridgetops and shoulder slopes and are moderately well drained. They formed in silty material and in the underlying loamy sediments. They have a fragipan. Typically, the surface layer is dark brown silt loam. The upper part of the subsoil is yellowish brown silty clay loam, and the lower part is a fragipan. The upper part of the fragipan is yellowish brown silt loam that has mottles in shades of brown. The next part is yellowish brown silt loam that has mottles in shades of brown and gray. The lower part of the fragipan is strong brown clay loam that has mottles in shades of brown, red, and gray.

Bude soils are on broad uplands and are somewhat poorly drained. They formed in silty material and in the underlying loamy sediments. They have a fragipan. Typically, the surface layer is dark brown silt loam. The upper part of the subsoil is silt loam that is mottled in shades of brown and gray. The next part is light yellowish brown silt loam that has mottles in shades of brown and gray. The lower part is a fragipan of silt loam that is mottled in shades of brown and gray.

Smithdale soils are on upland hillsides and are well drained. They formed in loamy material. Typically, the surface layer is dark brown sandy loam. The subsoil is red sandy clay loam in the upper part and red loam in the lower part.

Of minor extent in this unit are the somewhat poorly drained Gillsburg soils in drainageways and on flood plains, the poorly drained Trebloc soils in depressions, and the moderately well drained Loring soils on low hills and ridgetops. Loring soils have a fragipan.

Most of the acreage in this unit is used for pasture or row crops. Many areas are used as woodland. The nearly level and gently sloping areas of Providence and Bude soils are well suited to most of the crops and pasture grasses and legumes commonly grown in the county, but the strongly sloping Smithdale soils are

poorly suited because of the slope and the hazard of erosion.

These soils are well suited to woodland. If pine trees are planted, competition from undesirable plants is a moderate limitation in areas of the Providence soils and a severe limitation in areas of the Bude soils. The use of equipment is restricted in areas of the Smithdale soils where slopes are more than about 15 percent.

If these soils are used for urban development, the wetness is a moderate limitation in areas of the Providence soils and a severe limitation in areas of the Bude soils. Low strength is a severe limitation if the Providence and Bude soils are used as sites for local roads and streets. In areas of the Smithdale soils that have slopes of less than about 15 percent, the limitations affecting urban development are only moderate. The slope is a major concern in the steeper areas. The wetness and slow permeability in the fragipan are severe limitations if the Providence and Bude soils are used as sites for septic tank absorption fields. The slope is a severe limitation affecting this use in the steeper areas of the Smithdale soils.

These soils have good potential for use as habitat for openland wildlife and woodland wildlife, but the potential is poor in areas where slopes are more than 15 percent. Bude soils have fair potential for use as habitat for wetland wildlife, but the potential is very poor in areas of the Providence and Smithdale soils.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Providence silt loam, 2 to 5 percent slopes, eroded, is a phase of the Providence series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the components are somewhat similar in all areas. Pits-Udorthents complex is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Smithdale-Lexington association, 5 to 40 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Lorman and Smithdale soils, 15 to 35 percent slopes, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Riverwash is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The "Glossary" defines many of the terms used in describing the soils.

5—Oaklimeter silt loam, occasionally flooded. This moderately well drained, nearly level soil formed in silty alluvium on broad flood plains. Most areas are occasionally flooded, mainly in winter and early spring. The flooding is generally of brief duration. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; brown silt loam

Subsoil:
6 to 13 inches; yellowish brown silt loam that has pale brown mottles
13 to 27 inches; yellowish brown silt loam that has pale brown and light brownish gray mottles
27 to 62 inches; light brownish gray silt loam that has yellowish brown and pale brown mottles

Included with this soil in mapping are a few small areas of Ariel, Collins, Gillsburg, and Trebloc soils and small areas of soils that have a surface layer of loam or very fine sandy loam. Ariel soils are well drained and are in the slightly higher landscape positions near stream channels. Collins soils have bedding planes. They are in landscape positions similar to those of the Oaklimeter soil. The somewhat poorly drained Gillsburg and poorly drained Trebloc soils are in depressions and drainageways. Also included, near the larger streams, are small areas of soils that are sandy loam below a depth of 24 inches.

Important properties of the Oaklimeter soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 1.5 to 2.5 feet during winter and early spring
Flooding: Occasional, for brief periods after heavy rains, especially in winter and early spring
Root zone: Extends to a depth of 60 inches; somewhat restricted by the seasonal high water table
Tilth: The surface layer is friable and can be easily tilled throughout a wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or woodland. A small acreage is used as cropland.

This soil is well suited to row crops (fig. 2), small grain, and truck crops. If good management practices are applied, row crops can be grown every year. Seasonal wetness is the main limitation. Row arrangement and surface field ditches can remove excess surface water from low areas. Returning crop residue to the soil improves fertility and tilth and minimizes crusting. Seedbed preparation and cultivation are sometimes delayed in spring because of the wetness and the flooding. Most of the flooding occurs before crops are planted, but in some years flooding may damage crops during the growing season.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. Restricted use during wet periods minimizes surface compaction.

This soil is well suited to woodland. Most bottom-land hardwoods and pines that are tolerant of some wetness grow well, and these are the dominant native trees. Trees preferred for planting include cherrybark oak, eastern cottonwood, Nuttall oak, sweetgum, water oak, yellow-poplar, and loblolly pine. Plant competition is the main management concern, especially if pine trees are planted. Site preparation is needed to control competition from undesirable plants, but the benefits of site preparation do not extend beyond one growing season. Natural regeneration of hardwood species is probable in all openings of one-half acre or more. Harvesting timber during the drier seasons helps to prevent ruts and surface compaction.

This soil has good potential for use as habitat for openland and woodland wildlife. It has poor potential for use as habitat for wetland wildlife.

Flooding is a severe limitation on sites for residential and small commercial buildings and local roads. Flood-control measures are generally not practical because of the high cost and the possibility of property damage, but special design and proper engineering techniques can minimize the damage caused by flooding. The flooding and the wetness are severe limitations affecting septic tank absorption fields and subsurface waste-water disposal systems. Alternative sites should be selected.

The capability subclass is IIw, and the woodland ordination symbol is 10A.

9—Bruno sandy loam, frequently flooded. This nearly level and gently sloping, excessively drained soil formed in stratified sandy and loamy alluvium. It is on natural levees on the flood plains along the Homochitto River and its tributaries. It is subject to flooding, mainly from December to June. The flooding generally lasts for only a few days. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; yellowish brown sandy loam

Underlying material:
6 to 28 inches; stratified pale brown and light

Figure 2.—Cotton in an area of Oaklimeter silt loam, occasionally flooded.

yellowish brown loamy fine sand, sand, and sandy loam
28 to 64 inches; yellowish brown sand

Included with this soil in mapping are small areas of Ariel soils, which have a high content of silt, and Ochlockonee soils, which are loamy. These soils are in the lower positions on the flood plains. Also included are a few small areas of frequently flooded, silty and loamy soils in drainageways and some areas of overbank sandy deposits along channels.

Important properties of the Bruno soil—

Soil reaction: Strongly acid to moderately alkaline throughout the profile
Permeability: Rapid
Available water capacity: Low
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 4 to 6 feet during winter and spring
Flooding: Frequent, for brief periods after heavy rains, mainly in winter and spring
Root zone: Extends to a depth of 60 inches or more

A large acreage of this soil is used as woodland or for grass hay crops. A small acreage is used for pasture or row crops.

This soil is poorly suited to row crops, truck crops, and small grain because of droughtiness and the

frequent flooding. Flood-control measures generally are not economically feasible. The rapid permeability reduces the ability of the soil to retain plant nutrients.

This soil is poorly suited to grasses and legumes for hay and pasture because of low productivity, the sandy texture, droughtiness, and the flooding. Many species of grasses and legumes are difficult to establish because of the droughtiness. Overgrazing, especially during periods of low moisture, causes stands to die out. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is moderately suited to woodland. The dominant trees are drought-tolerant species typical of river-border communities. Trees preferred for planting include eastern cottonwood, black willow, American sycamore, cherrybark oak, willow oak, and loblolly pine. The sandy texture can cause droughty conditions, which increase the seedling mortality rate. Planting should be timed so that seedlings can become established before the flooding or droughty conditions occur. Competing vegetation around pine seedlings should be controlled until the seedlings become established. Because of the flooding, management activities that involve the use of heavy equipment should be planned for summer and fall.

This soil has poor potential for use as habitat for openland wildlife and woodland wildlife and very poor potential for use as habitat for wetland wildlife.

The flooding is a severe limitation on sites for residential and small commercial buildings and for local roads. Flood-control measures generally are not practical because of the high cost and the possibility of property damage. The flooding is also a severe limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems. If this soil is used as a waste-water disposal site, the contamination of ground water is a hazard because of the poor filtering capacity. Alternative sites should be selected.

The capability subclass is Vw, and the woodland ordination symbol is 8S.

10—Ariel silt loam, occasionally flooded. This nearly level, well drained soil formed in silty alluvium on broad flood plains. It is subject to flooding, mainly from February to April. The flooding generally lasts for only a few days. Slopes are 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; dark brown silt loam

Subsoil:
6 to 18 inches; dark yellowish brown silt loam
18 to 27 inches; dark yellowish brown silt loam that has light yellowish brown mottles
27 to 36 inches; mottled pale brown, yellowish brown, and light brownish gray silt loam
36 to 62 inches; mottled light brownish gray and light yellowish brown silt loam

Included with this soil in mapping are a few small areas of Collins, Gillsburg, and Oaklimeter soils. The moderately well drained Collins and Oaklimeter soils are in the lower positions on the flood plains. The somewhat poorly drained Gillsburg soils are along drainageways. Also included are small areas of frequently flooded soils near channels and a few areas that have slopes of 2 percent.

Important properties of the Ariel soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate in the surface layer and the upper part of the subsoil and moderately slow in the lower part of the subsoil
Available water capacity: High
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 2.5 to 4.0 feet in winter and early spring
Flooding: Occasional, for brief periods after heavy rains in winter and early spring
Root zone: Extends to a depth of about 60 inches; somewhat restricted by the seasonal high water table
Tilth: The surface layer is friable and can be easily tilled throughout a wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or as woodland. A small acreage is used as cropland.

This soil is well suited to row crops (fig. 3), small grain, and truck crops. If good management practices are applied, row crops can be grown every year and maximum yields can be obtained. Seasonal wetness is the main concern. Row arrangement and surface field ditches can remove excess surface water. Returning crop residue to the soil improves tilth and minimizes crusting. Seedbed preparation and cultivation are sometimes delayed in spring because of the wetness. The soil is subject to flooding, but the flooding rarely occurs during the growing season.

Figure 3.—Soybeans ready to be harvested in an area of Ariel silt loam, occasionally flooded.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. Restricted use during wet periods minimizes surface compaction.

This soil is well suited to woodland. Bottom-land hardwoods and pines that are tolerant of occasional flooding grow well, and these are the dominant native trees. Trees preferred for planting include cherrybark oak, eastern cottonwood, water oak, sweetgum, yellow-poplar, and loblolly pine. Plant competition is the main management concern, especially if pine trees are planted. Site preparation is needed to control competition from undesirable plants, but the benefits of site preparation do not extend beyond one growing season. Natural regeneration of hardwood species is probable in all openings of one-half acre or more. Harvesting timber during the drier seasons helps to prevent ruts and surface compaction.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The flooding is a severe limitation on sites for residential and small commercial buildings and for local

roads. Flood-control measures are generally not economically feasible. The flooding, the wetness, and the moderately slow permeability are severe limitations affecting septic tank absorption fields and subsurface waste-water disposal systems. Alternative sites should be selected.

The capability subclass is IIw, and the woodland ordination symbol is 10A.

11—Collins silt loam, occasionally flooded. This nearly level, moderately well drained soil formed in silty alluvium on the broad flood plains along the Homochitto River. Most areas are subject to flooding, mainly in winter and early spring. The flooding is of brief duration. Slopes are 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; brown silt loam

Underlying material:
6 to 16 inches; yellowish brown silt loam
16 to 25 inches; yellowish brown silt loam that has light brownish gray and pale brown mottles
25 to 38 inches; mottled light brownish gray and yellowish brown silt loam
38 to 47 inches; light brownish gray silt loam that has yellowish brown and pale brown mottles
47 to 60 inches; mottled yellowish brown, light brownish gray, and pale brown silt loam

Included with this soil in mapping are a few small areas of Bruno, Gillsburg, and Trebloc soils. The sandy Bruno soils are excessively drained and are on natural levees. The somewhat poorly drained Gillsburg soils are in depressions along drainageways. The poorly drained Trebloc soils are in broad depressional flats on low stream terraces. Also included are a few small areas of soils that are medium acid to neutral within the upper 30 inches and a few small areas of soils that have a surface layer of loam, very fine sandy loam, or fine sandy loam.

Important properties of the Collins soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 2 to 5 feet in winter and early spring
Flooding: Occasional, for brief periods after heavy rains in winter and early spring
Root zone: Extends to a depth of about 60 inches; somewhat restricted by the seasonal high water table
Tilth: The surface layer is friable and can be easily tilled throughout a wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or woodland. A small acreage is used as cropland.

This soil is well suited to row crops (fig. 4), small grain, and truck crops. If good management practices are applied, row crops can be grown every year. Seasonal wetness is the main limitation. Row arrangement and surface field ditches can remove excess surface water from low areas. Returning crop residue to the soil improves fertility and tilth and minimizes crusting. Seedbed preparation and cultivation are sometimes delayed in spring because of the wetness and the flooding. Most of the flooding occurs before crops are planted, but in some years flooding may damage crops during the growing season.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. Restricted use during wet periods minimizes surface compaction.

This soil is well suited to woodland. Most bottom-land hardwoods and pines that are tolerant of some wetness grow well, and these are the dominant trees in wooded areas. Trees preferred for planting include cherrybark oak, eastern cottonwood, green ash, yellow-poplar, and loblolly pine. Plant competition is the main management concern, especially if pine trees are planted. Site preparation is needed to control competition from undesirable plants, but the benefits of site preparation do not extend beyond one growing season. Natural regeneration of hardwood species is probable in all openings of one-half acre or more. Harvesting timber during the drier seasons helps to prevent ruts and surface compaction.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has poor potential for use as habitat for wetland wildlife.

The flooding is a severe limitation on sites for residential and small commercial buildings and for local roads. Flood-control measures are generally not practical because of the high cost and the possibility of property damage. Special design and proper engineering techniques can minimize the damage

Figure 4.—Corn in an area of Collins silt loam, occasionally flooded.

caused by flooding. The flooding and the wetness are severe limitations affecting septic tank absorption fields and subsurface waste-water disposal systems. Alternative sites should be selected.

The capability subclass is IIw, and the woodland ordination symbol is 4A.

12—Bruno sandy loam, occasionally flooded. This nearly level and gently sloping, excessively drained soil formed in stratified sandy and loamy alluvium. It is on natural levees on flood plains. It is subject to flooding, mainly from February to April. The duration of the flooding generally ranges from a few hours to a few days. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:

0 to 7 inches; brown sandy loam

Underlying material:

7 to 40 inches; stratified light olive brown and pale brown loamy fine sand, sand, and loamy sand

40 to 60 inches; pale brown sand

Included with this soil in mapping are small areas of Ariel and Ochlockonee soils. These included soils are

well drained and are in the slightly lower positions on the flood plains. Ariel soils are silty, and Ochlockonee soils are loamy. Also included are a few small areas of frequently flooded soils and areas of riverwash.

Important properties of the Bruno soil—

Soil reaction: Strongly acid to slightly acid throughout the profile
Permeability: Rapid
Available water capacity: Low
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 4 to 6 feet in winter and early spring
Flooding: Occasional, for brief periods after heavy rains in winter and early spring
Root zone: Extends to a depth of 60 inches or more
Tilth: The surface layer is friable and can be easily tilled throughout a wide range in moisture content.

A large acreage of this soil is used as woodland or for grass hay crops. A small acreage is used for pasture or row crops.

This soil is moderately suited to row crops and truck crops that are tolerant of droughty conditions. It is moderately suited to small grain, but flooding in winter and spring can damage small grain crops. Droughtiness is the main concern during prolonged dry periods in summer. Leaving crop residue on or near the surface conserves moisture. The soil dries quickly after rains. The rapid permeability results in the leaching of lime and fertilizer, and thus frequent applications are needed. The soil is subject to flooding, but the flooding rarely occurs during the growing season.

This soil is poorly suited to grasses and legumes for hay and pasture because of low productivity. Some plants are difficult to establish because the soil is sandy and droughty. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is moderately suited to woodland. The dominant trees are drought-tolerant species typical of river-border communities. Trees preferred for planting include cherrybark oak, willow oak, loblolly pine, and sweetgum. The sandy texture can cause droughty conditions, which increase the seedling mortality rate. Planting should be timed so that seedlings can become established before the flooding or droughty conditions occur. Also, a cover of mulch conserves soil moisture. Competing vegetation around pine seedlings should be controlled until the seedlings become established. Site preparation and applications of approved herbicides can help to control plant competition.

This soil has poor potential for use as habitat for openland wildlife and woodland wildlife and very poor potential for use as habitat for wetland wildlife.

The flooding is a severe limitation on sites for residential and small commercial buildings and for local roads. Flood-control measures generally are not practical because of the high cost and the possibility of property damage. The flooding is also a severe limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems. If the soil is used as a waste-water disposal site, the contamination of ground water is a hazard because of the poor filtering capacity. Alternative sites should be selected.

The capability subclass is IIIs, and the woodland ordination symbol is 8S.

13—Ochlockonee fine sandy loam, occasionally flooded. This nearly level, well drained soil formed in loamy alluvium on flood plains. Most areas are subject to flooding, mainly in winter and early spring. The flooding is of very brief duration. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches; dark yellowish brown fine sandy loam

Underlying material:
5 to 65 inches; dark brown, yellowish brown, brown, and dark yellowish brown, stratified fine sandy loam, sandy loam, loamy sand, loam, and silt loam

Included with this soil in mapping are small areas of Ariel and Bruno soils and a few small areas of somewhat poorly drained soils in drainageways. Ariel soils have a high content of silt. They are in landscape positions similar to those of the Ochlockonee soil. Bruno soils have a high content of sand. They are in the slightly higher positions on natural levees. Also included are small areas of soils that have a surface layer of silt loam and soils that have silty strata and are medium acid to neutral. Some areas bordering channels are subject to overbank sand deposition during flooding, and areas along overflow channels are subject to scouring.

Important properties of the Ochlockonee soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow

Erosion hazard: Slight
Depth to the water table: 3 to 5 feet in winter and early spring
Flooding: Occasional, for very brief periods after heavy rains in winter and early spring
Root zone: Extends to a depth of 60 inches or more
Tilth: The surface layer is friable and can be easily tilled, but it tends to crust after heavy rains.

Most areas of this soil are used as cropland or pasture. A small acreage is used as woodland.

This soil is well suited to row crops, small grain, and truck crops. If good management practices are applied, row crops can be grown every year and maximum yields can be obtained. Seasonal wetness is the main concern. Row arrangement and surface field ditches can remove excess surface water from low areas. Returning crop residue to the soil improves tilth and minimizes crusting. Seedbed preparation and cultivation are sometimes delayed in spring because of excess moisture. The soil is subject to flooding, but the flooding rarely occurs during the growing season.

This soil is well suited to grasses and legumes for pasture and hay. Overgrazing or grazing when the soil is too wet causes surface compaction and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. Restricted use during wet periods minimizes surface compaction.

This soil is well suited to woodland. Bottom-land hardwoods and pines that are tolerant of occasional flooding grow well, and these are the dominant trees in wooded areas. Trees preferred for planting include eastern cottonwood, sweetgum, yellow-poplar, and loblolly pine. Plant competition is the main management concern. If pine trees are planted, site preparation is needed to control competition from undesirable plants. The benefits of site preparation do not extend beyond one growing season. Natural regeneration of hardwood species is probable in all openings of one-half acre or more. Harvesting timber during the drier seasons helps to prevent ruts and surface compaction.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The flooding is a severe limitation on sites for residential and small commercial buildings and for local roads. Special design and proper engineering techniques can help to overcome this limitation. Flood-control measures are generally not economically feasible. The flooding and the wetness are severe limitations affecting septic tank absorption fields and subsurface waste-water disposal systems. Alternative sites should be selected.

The capability subclass is IIw, and the woodland ordination symbol is 11A.

14—Gillsburg silt loam, occasionally flooded. This nearly level, somewhat poorly drained soil formed in silty alluvium on broad flood plains and in drainageways. Most areas are subject to flooding, mainly in winter and early spring. The flooding is of brief duration. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; dark grayish brown silt loam

Upper subsoil:
6 to 16 inches; mottled brown, light brownish gray, and dark brown silt loam
16 to 34 inches; light brownish gray silt loam that has brown and yellowish brown mottles

Buried subsurface layer:
34 to 41 inches; light brownish gray silt loam that has yellowish brown mottles

Lower subsoil:
41 to 64 inches; light brownish gray silt loam that has yellowish brown and dark grayish brown mottles

Included with this soil in mapping are small areas of Ariel, Collins, Oaklimeter, and Trebloc soils. The well drained Ariel and moderately well drained Collins and Oaklimeter soils are in the slightly higher positions on the landscape. The poorly drained Trebloc soils are in broad depressional flats on low stream terraces. Also included are small areas of soils that have a high content of sodium in the lower part of the subsoil and a few small areas of soils that have a surface layer of silt or very fine sandy loam.

Important properties of the Gillsburg soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate in the surface layer and the upper part of the subsoil and moderately slow in the lower part of the subsoil
Available water capacity: High
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 1 to 2 feet in late winter and early spring
Flooding: Occasional, for brief periods after heavy rains in winter and early spring
Root zone: Extends to a depth of about 60 inches;

somewhat restricted by the seasonal high water table

Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or woodland. A small acreage is used for crops.

This soil is suited to row crops, small grain, and truck crops. Seasonal wetness and the flooding are the main management concerns (fig. 5). Row arrangement and surface field ditches can remove excess surface water. Returning crop residue to the soil improves tilth, minimizes crusting, and helps to maintain fertility. Seedbed preparation and cultivation are sometimes delayed in spring because of the wetness and the flooding. Most of the flooding occurs before crops are planted, but after periods of heavy rainfall in summer, crops in some of the lower areas are subject to moderate damage unless they are protected from flooding.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth and reduces the rate of water infiltration. Restricted use during wet periods minimizes surface compaction. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. Growth can be delayed in spring because of wetness, and some plants in the lower areas can be damaged by flooding.

This soil is well suited to woodland. Bottom-land hardwoods and pines that are tolerant of wetness and flooding grow well (fig. 6), and these are the dominant trees in wooded areas. Trees preferred for planting include cherrybark oak, eastern cottonwood, sweetgum, American sycamore, yellow-poplar, and loblolly pine. Seasonal wetness is a moderate limitation affecting the use of equipment, but it can be partly overcome by harvesting during the drier seasons. Plant competition is a severe limitation if pine trees are planted. Site preparation is needed to control competition from undesirable plants, but the benefits of site preparation do not extend beyond one growing season. Natural regeneration of hardwood species is probable in all openings of one-half acre or more. Using heavy equipment only during the drier parts of the year minimizes surface compaction and helps to prevent the formation of ruts.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has fair potential for use as habitat for wetland wildlife.

The flooding and the wetness are severe limitations on sites for residential and building site development, and the flooding is a major concern on sites for local roads. Special design and proper engineering techniques can help to overcome these limitations. Flood-control measures are generally not economically feasible. The flooding, the wetness, and the restricted permeability are severe limitations affecting septic tank absorption fields and subsurface waste-water disposal systems. Alternative sites should be selected.

The capability subclass is IIw, and the woodland ordination symbol is 10W.

23A—Cahaba sandy loam, 0 to 3 percent slopes. This well drained soil formed in loamy alluvium. It is on stream terraces along the major streams in the county.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches; dark yellowish brown sandy loam

Subsoil:
8 to 32 inches; yellowish red sandy clay loam
32 to 43 inches; yellowish red loam
43 to 55 inches; strong brown sandy loam

Underlying material:
55 to 62 inches; strong brown sandy loam

Included with this soil in mapping are small areas of Memphis and Providence soils in the higher positions on foot slope benches in the adjacent uplands. Memphis soils are silty throughout. The moderately well drained Providence soils have a fragipan. Also included are small areas of soils in the lower positions on the landscape that are subject to occasional flooding, areas of severely eroded soils that have slopes of 0 to 6 percent, a few areas of soils that have sandy layers in the subsoil, and areas of soils that have a seasonal high water table at a depth of about 3 feet.

Important properties of the Cahaba soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate in the subsoil and moderately rapid or rapid in the underlying material
Available water capacity: Moderate
Surface runoff: Slow or medium
Erosion hazard: Slight
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Deep; can be easily penetrated by roots to a depth of 60 inches or more
Tilth: The surface layer is friable and can be easily tilled throughout a wide range in moisture content.

Figure 5.—A flooded field of soybeans in an area of Gillsburg silt loam, occasionally flooded.

Most areas of this soil are used as cropland or pasture. A small acreage is used as woodland.

This soil is well suited to row crops, truck crops, and small grain. Using a system of conservation tillage and returning crop residue to the soil improve tilth and minimize crusting and packing after periods of heavy rainfall.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. Restricted use during wet periods minimizes surface compaction.

This soil is well suited to woodland. Few limitations affect management. Mixed hardwoods and pines are the dominant trees in most wooded areas. Trees preferred for planting include loblolly pine, slash pine, shortleaf pine, sweetgum, and water oak. Plant competition is a management concern if pine trees are planted. Site preparation can help to control undesirable

Figure 6.—A small stream bordered by bottom-land hardwoods in an area of Gillsburg silt loam, occasionally flooded.

plants, but the benefits of site preparation do not extend beyond one growing season.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

This soil is well suited to residential and small commercial buildings and to local roads. Erosion is a hazard on construction sites. Vegetation should be established in disturbed areas as soon as possible. Septic tank absorption fields and waste-water disposal systems generally function satisfactorily if they are properly designed and installed.

The capability class is I, and the woodland ordination symbol is 9A.

30B2—Memphis silt loam, 2 to 5 percent slopes, eroded. This well drained, gently sloping soil formed in thick deposits of loess. It is on ridgetops in highly dissected uplands and on broad, irregular ridgetops in the less sloping areas.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; dark brown silt loam

Subsoil:
6 to 34 inches; dark brown silty clay loam
34 to 45 inches; strong brown silt loam

Underlying material:
45 to 80 inches; strong brown silt loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few

rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Lexington and Loring soils. Lexington soils have a higher content of sand in the subsoil than the Memphis soil. They are on crests of narrow ridges. Loring soils are moderately well drained and are intermingled at the head of drainageways. They have a fragipan. Also included are some small areas of severely eroded soils that have a surface layer made up mostly of subsoil material.

Important properties of the Memphis soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Medium
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Deep; can be easily penetrated by roots to a depth of 60 inches or more
Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or cropland. A small acreage is used as woodland.

This soil is well suited to row crops, truck crops, and small grain. High yields can be obtained if proper management practices are applied and fertility is maintained. The hazard of erosion is the main limitation. Crop rotations, conservation tillage (fig. 7), grassed waterways, terraces, and contour farming can help to control erosion in cultivated areas. Returning crop residue to the soil improves fertility and tilth and minimizes crusting.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also is effective in controlling erosion. Grazing when the soil is too wet causes surface compaction. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees in wooded areas. The soil is well suited to a variety of trees. Trees preferred for planting include cherrybark oak, loblolly pine, white oak, and yellow-poplar. Site preparation is needed to control undesirable vegetation if pine trees are planted. Harvesting timber during the drier seasons helps to prevent ruts and surface compaction.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

This soil is well suited to residential and commercial buildings. During and after construction, vegetation should be established to control erosion and to prevent offsite sedimentation. Low strength is a severe limitation affecting local roads. Special design and proper construction techniques can help to overcome this limitation. Septic tank absorption fields and subsurface waste-water disposal systems generally function satisfactorily if they are properly designed and installed.

The capability subclass is IIe, and the woodland ordination symbol is 12A.

30C2—Memphis silt loam, 5 to 8 percent slopes, eroded. This well drained, sloping soil formed in thick deposits of loess. It is on hillsides in the uplands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; brown silt loam

Subsoil:
6 to 30 inches; dark brown silty clay loam
30 to 72 inches; strong brown silt loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small intermingled areas of Lexington and Loring soils. Lexington soils have a higher content of sand in the subsoil than the Memphis soil. Loring soils are moderately well drained and are at the head of drainageways. They have a fragipan. Also included are some small areas of severely eroded soils that have a surface layer made up of subsoil material.

Important properties of the Memphis soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Medium
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Deep; can be easily penetrated by roots to a depth of 60 inches or more
Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Figure 7.—No-till soybeans planted directly in the stubble of the previous crop in an area of Memphis silt loam, 2 to 5 percent slopes, eroded.

Most areas of this soil are used as pasture or cropland. A small acreage is used as woodland.

This soil is moderately suited to row crops, truck crops, and small grain. Erosion is a severe hazard. Conservation tillage, grassed waterways, terraces, contour stripcropping, and contour farming help to control erosion in cultivated areas. Rotating crops helps to maintain the content of organic matter and improves soil moisture. Returning crop residue to the soil improves fertility and tilth and helps to prevent crusting and surface compaction.

This soil is well suited to grasses and legumes for hay crops and pasture. Growing grasses and legumes also helps to control erosion. Grazing when the soil is too wet causes surface compaction. Proper stocking rates, controlled grazing during wet periods, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Few limitations affect management. Oaks, pines, and hickories are the dominant trees in wooded areas. The soil is well suited to a variety of trees. Trees preferred for planting include cherrybark oak, loblolly pine, and yellow-poplar. Site preparation is needed to control undesirable species if pine trees are planted. Harvesting timber during the drier seasons helps to prevent ruts and compaction. Harvesting methods that minimize the risk of erosion should be used.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

This soil is well suited to residential development. The slope is a moderate limitation on sites for small commercial buildings. Low strength is a severe limitation on sites for local roads. Special design can help to overcome these limitations. During and after

construction, vegetation should be established to prevent offsite sedimentation. Septic tank absorption fields and subsurface waste-water disposal systems generally function satisfactorily if they are properly designed and installed.

The capability subclass is IIIe, and the woodland ordination symbol is 12A.

30F1—Memphis silt loam, 15 to 35 percent slopes. This well drained, moderately steep and steep soil formed in thick deposits of loess. It is on steep hillsides between narrow, winding ridgetops in highly dissected uplands in the loessial hills.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches; dark brown silt loam

Subsoil:
8 to 36 inches; dark brown silty clay loam
36 to 48 inches; dark brown silt loam

Underlying material:
48 to 72 inches; strong brown silt loam

Included with this soil in mapping are small areas of Lexington, Loring, and Smithdale soils. Lexington soils have a higher content of sand in the subsoil than the Memphis soil. They are on narrow, winding ridgetops. Loring soils are moderately well drained and are on the lower part of foot slopes. They have a fragipan. Smithdale soils are loamy throughout. They are in landscape positions similar to those of the Memphis soil. Also included are small areas of severely eroded soils that have a surface layer made up of subsoil material and some areas in which natural drainageways have developed into actively eroding gullies. These gullies, which range from 5 to 20 feet in depth, are the result of accelerated runoff caused by farming or logging activities.

Important properties of the Memphis soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Deep; can be easily penetrated by roots to a depth of 60 inches or more

Most areas of this soil are used as pasture or woodland. A small acreage is used for crops.

This soil is not suited to row crops, truck crops, or small grain because of the slope and the hazard of erosion. Even if erosion-control or conservation practices are applied, soil loss will exceed the level that is acceptable for crops.

This soil is poorly suited to grasses and legumes for hay and pasture. Plants are very difficult to establish and maintain because of the slope. The hazard of erosion is severe unless a dense, vigorous, and continuous plant cover is maintained. Even the bare surfaces in animal paths are susceptible to accelerated erosion that can result in the formation of gullies.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Yellow-poplar, beech, and sweetgum are common on the lower foot slopes bordering drainageways. Trees preferred for planting include cherrybark oak, loblolly pine, and yellow-poplar. The use of equipment for harvesting and regeneration activities is limited because of the slope. Plant competition is a major concern if pine trees are planted. Roads and log landings can be protected against erosion by constructing diversions and by vegetating cuts and fills. Harvesting practices that minimize the risk of erosion should be used. Constructing roads across the slope helps to prevent the formation of gullies. Site preparation is needed to control undesirable plant competition if pine trees are planted.

This soil has poor potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The slope is a severe limitation on sites for residential and small commercial buildings. The slope and low strength are severe limitations on sites for local roads and streets. Overcoming these limitations is not practical. The slope is a severe limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems. In areas that have slopes of less than 30 percent, field lines can be installed on the contour. In areas that have slopes of more than 30 percent, alternative waste-water disposal systems are needed because the effluent from subsurface disposal systems can surface in downslope areas and cause the pollution of ground water.

The capability subclass is VIIe, and the woodland ordination symbol is 12R.

30F2—Memphis silt loam, 8 to 45 percent slopes, eroded. This well drained, sloping to steep soil formed in thick deposits of loess. It is on strongly sloping to steep hillsides between narrow, winding ridgetops in highly dissected uplands in the loessial hills.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 36 inches; dark brown silty clay loam

Underlying material:
36 to 72 inches; dark brown silt loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas, and a few deep gullies are in other areas.

Included with this soil in mapping are small areas of Lexington, Loring, and Smithdale soils. Lexington soils have a higher content of sand in the subsoil than the Memphis soil. They are on narrow, winding ridgetops. Loring soils are moderately well drained and are on the lower part of foot slopes. They have a fragipan. Smithdale soils are loamy throughout. They are in landscape positions similar to those of the Memphis soil. Also included are a few small areas of severely eroded soils in which the original surface layer and part of the subsoil have eroded away and some areas where drainageways have developed into actively eroding gullies. Some of these gullies are more than 20 feet deep. The gullies are the result of accelerated runoff caused by farming or logging activities. In some places, stream undercutting and massive slumping have left high vertical walls of unweathered loess exposed.

Important properties of the Memphis soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Deep; can be easily penetrated by roots to a depth of 60 inches or more

Most areas of this soil are used as pasture or woodland. A small acreage is used for crops.

This soil is not suited to row crops, truck crops, or small grain because of the slope and the hazard of erosion. Even if erosion-control or conservation practices are applied, soil loss will exceed the level that is acceptable for crops.

This soil is poorly suited to grasses and legumes for hay and pasture. Plants are very difficult to establish and maintain because of the slope. The hazard of erosion is severe unless a dense, vigorous, and continuous plant cover is maintained. Even the bare surfaces in animal paths are susceptible to accelerated erosion, which can result in the formation of gullies.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Yellow-poplar, beech, and sweetgum are common on the lower foot slopes bordering drainageways. Trees preferred for planting include cherrybark oak, loblolly pine, and yellow-poplar. The use of equipment for harvesting and regeneration activities is limited because of the slope. Plant competition is a major concern if pine trees are planted. Roads and log landings can be protected against erosion by constructing diversions and by vegetating cuts and fills. Harvesting methods that minimize the risk of erosion should be used to prevent gullying and offsite sedimentation. Constructing roads across the slope helps to prevent the formation of gullies. Site preparation is needed to control undesirable plant competition if pine trees are planted.

This soil has fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The slope is a severe limitation on sites for residential and small commercial buildings. The slope and low strength are limitations on sites for local roads and streets. Overcoming these limitations generally is not practical. The slope is a severe limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems. In areas that have slopes of less than 30 percent, field lines can be installed on the contour. In areas that have slopes of more than 30 percent, alternative waste-water disposal systems are needed because the effluent from subsurface disposal systems can surface in downslope areas and cause the pollution of ground water.

The capability subclass is VIe, and the woodland ordination symbol is 12R.

31A—Loring silt loam, 0 to 2 percent slopes. This moderately well drained, nearly level soil formed in thick deposits of loess. It is on broad ridgetops in undulating to rolling uplands. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches; dark brown silt loam

Subsoil:
8 to 20 inches; strong brown silt loam that has yellowish brown mottles in the lower part
20 to 68 inches; a brittle and compact fragipan of strong brown silt loam that has yellowish brown and light brownish gray mottles

Included with this soil in mapping are small areas of Lexington, Memphis, and Providence soils. The well drained Lexington and Memphis soils do not have a fragipan. Lexington soils are on narrow, winding ridgetops. Memphis soils are mainly in the higher positions on ridgetops. Providence soils have a higher content of sand below the fragipan than the Loring soil. They are on narrow ridgetops and on shoulder slopes.

Important properties of the Loring soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate in the upper part of the subsoil and slow in the fragipan
Available water capacity: Moderate
Surface runoff: Slow
Erosion hazard: Moderate
Depth to the water table: Perched above the fragipan at a depth of 2 to 3 feet during winter and early spring
Flooding: None
Root zone: Somewhat restricted at a depth of 2 to 3 feet because of the compact, brittle fragipan
Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or cropland. A small acreage is used as woodland.

This soil is well suited to a variety of row crops, truck crops, and small grain. Seasonal wetness is the main limitation. The restricted root zone and the moderate available water capacity are additional management concerns. Proper row arrangement and surface field ditches can remove surface water from low places. Crop rotations that include grasses and legumes help to maintain the content of organic matter and improve soil moisture. Returning crop residue to the soil helps to maintain fertility and tilth and minimizes crusting and surface compaction.

This soil is well suited to grasses and legumes for hay and pasture. Overgrazing or grazing when the soil is too wet causes surface compaction and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition and minimize surface compaction.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, cherrybark oak, and yellow-poplar. Seasonal wetness is a moderate concern affecting the use of equipment. Using special equipment and logging during the drier seasons help to overcome the wetness, minimize soil compaction, and help to prevent the formation of ruts. If pine trees are planted, plant competition is severe (fig. 8). Proper site preparation can help to control undesirable plants, and spraying controls subsequent growth.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The wetness caused by the seasonal high water table is a moderate limitation on sites for residential and small commercial buildings. Low strength is a severe limitation on sites for local roads. Special design and proper engineering techniques can help to overcome these limitations. The wetness and the slow permeability in the fragipan severely limit the use of this soil for septic tank absorption fields or subsurface waste-water disposal systems. Special design of subsurface waste-water disposal systems can help to overcome these limitations, or alternative systems can be used.

The capability subclass is IIw, and the woodland ordination symbol is 10A.

31B2—Loring silt loam, 2 to 5 percent slopes, eroded. This moderately well drained, gently sloping soil formed in thick deposits of loess. It is on broad ridgetops in dissected uplands. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches; dark brown silt loam

Subsoil:
6 to 24 inches; yellowish brown silt loam
24 to 34 inches; a firm, brittle, and compact fragipan of mottled yellowish brown, pale brown, and light gray silt loam
34 to 46 inches; a firm, brittle, and compact fragipan of yellowish brown silt loam that has light brownish gray mottles
46 to 61 inches; a firm, slightly brittle, and compact fragipan of mottled strong brown, light yellowish brown, and light gray silt loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other

Figure 8.—Loblolly pine in an area of Loring silt loam, 0 to 2 percent slopes. Controlled burning reduces competition from undesirable hardwoods on this site.

areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Memphis and Providence soils and small areas of soils that have slopes ranging to 8 percent. Memphis soils are well drained and are on the narrow, higher ridgetops. They do not have a fragipan. Providence soils have a higher content of sand in the subsoil below the fragipan than the Loring soil. They are mainly on shoulder slopes. Also included are small areas of severely eroded Loring soils that have a fragipan within a depth of 16 inches and in which the surface layer is made up of subsoil material.

Important properties of the Loring soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed

Permeability: Moderate in the upper part of the subsoil and slow in the fragipan

Available water capacity: Moderate

Surface runoff: Medium

Erosion hazard: Severe

Depth to the water table: Perched above the fragipan at a depth of 2 to 3 feet during winter and early spring

Flooding: None

Root zone: Restricted at a depth of 2 to 3 feet because of the compact, brittle fragipan

Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or cropland. A small acreage is used as woodland.

This soil is well suited to a variety of row crops, truck crops, and small grain if erosion is controlled. Seasonal wetness, the restricted root zone, and the moderate available water capacity are also limitations. Conservation tillage, terraces, grassed waterways, and contour farming help to control erosion in cultivated areas. Crop rotations help to maintain the content of organic matter and improve soil moisture. Returning crop residue to the soil helps to maintain fertility and tilth and minimizes crusting.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also is effective in controlling erosion. Grazing when the soil is too wet causes surface compaction. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition and minimize surface compaction.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, cherrybark oak, and yellow-poplar. The seasonal wetness is a moderate concern affecting the use of equipment. Using special equipment and logging during the drier seasons help to overcome the wetness, help to prevent the formation of ruts, and minimize surface compaction. Plant competition is severe. If pine trees are planted, proper site preparation can help to control undesirable species and spraying can help to control subsequent growth.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The wetness is a moderate limitation on sites for residential and small commercial buildings. Low strength is a severe limitation on sites for local roads. Special design and proper engineering techniques help to overcome some of these limitations. The wetness and the slow permeability in the fragipan severely limit the use of this soil as a site for septic tank absorption fields or subsurface waste-water disposal systems. Special design of subsurface waste-water disposal systems can help to overcome these limitations, or alternative systems can be used.

The capability subclass is IIe, and the woodland ordination symbol is 10A.

31C2—Loring silt loam, 5 to 8 percent slopes, eroded. This moderately well drained, sloping soil formed in thick deposits of loess. It is on the lower ridges and side slopes. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:

0 to 6 inches; yellowish brown silt loam

Subsoil:

6 to 26 inches; dark yellowish brown silty clay loam

26 to 72 inches; a firm, brittle, and compact fragipan of mottled dark yellowish brown, light brownish gray, and strong brown silt loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Smithdale and Providence soils. Smithdale soils are mainly on short escarpments near drainageways and on the lower parts of hillsides. They are loamy throughout. Providence soils have a higher content of sand in the subsoil than the Loring soil. Also included are small areas of severely eroded soils that have a fragipan within a depth of 16 inches and small areas of gently sloping soils.

Important properties of the Loring soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed

Permeability: Moderate in the upper part of the subsoil and slow in the fragipan

Available water capacity: Moderate

Surface runoff: Medium

Erosion hazard: Severe

Depth to the water table: Perched above the fragipan at a depth of 2 to 3 feet during winter and early spring

Flooding: None

Root zone: Somewhat restricted at a depth of 2 to 3 feet because of the compact, brittle fragipan

Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as pasture or cropland. A small acreage is used as woodland.

This soil is moderately suited to a variety of row crops, truck crops, and small grain. Erosion is a major concern. The restricted root zone, the moderate

available water capacity, and seasonal wetness are also limitations. Conservation tillage, cover crops, grassed waterways, terraces, contour stripcropping, and contour farming help to control erosion in cultivated areas. Crop rotations help to maintain the content of organic matter and improve soil moisture. Returning crop residue to the soil helps to maintain fertility and tilth and minimizes crusting and surface compaction.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also helps to control erosion. Grazing when the soil is too wet causes surface compaction. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition and minimize surface compaction.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, cherrybark oak, and yellow-poplar. The seasonal wetness and the hazard of erosion restrict the use of equipment. Plant competition is a severe limitation. Using equipment only during the drier periods reduces the hazard of erosion and minimizes surface compaction and the formation of ruts. Proper site preparation helps to control competition from undesirable plants in areas where pine trees are being established.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

This soil is moderately suited to residential and small commercial buildings. The wetness is a moderate limitation affecting residential development. The wetness and the slope are moderate limitations on sites for small commercial buildings. Low strength is a severe limitation on sites for local roads and streets. Special design and proper construction techniques help to overcome these limitations. The seasonal wetness and the slow permeability in the fragipan severely limit the use of this soil as a site for septic tank absorption fields or subsurface waste-water disposal systems. Special design of subsurface waste-water disposal systems can help to overcome these limitations, or alternative systems can be used.

The capability subclass is IIIe, and the woodland ordination symbol is 10R.

38D1—Smithdale sandy loam, 8 to 15 percent slopes. This well drained, sloping and strongly sloping soil formed in loamy sediments. It is on hillsides and along incised drainageways in rolling and hilly uplands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches; dark brown sandy loam

Subsurface layer:
3 to 6 inches; brown sandy loam

Subsoil:
6 to 23 inches; yellowish red loam
23 to 47 inches; red sandy clay loam that has pockets of pale yellow sand
47 to 62 inches; red sandy loam

Included with this soil in mapping are small areas of Kolin, Lexington, Lorman, Providence, and Saffell soils. Kolin, Lexington, and Providence soils are silty in the surface layer and the upper part of the subsoil. The moderately well drained Kolin and Providence soils are on narrow ridgetops. Providence soils have a fragipan. Lorman soils have a high content of clay. They are mainly on the steeper hillsides below the Smithdale soil. Saffell soils are gravelly throughout and are intermingled with areas of the Smithdale soil.

Important properties of the Smithdale soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 5 feet
Flooding: None
Root zone: 60 inches or more

Most areas of this soil are used as pasture or woodland.

This soil is poorly suited to row crops, truck crops, and small grain because of the slope and the severe hazard of erosion. Conservation tillage, grassed waterways, crop rotation, and contour farming help to control erosion in cultivated areas.

This soil is moderately suited to grasses and legumes for hay and pasture. The slope, the hazard of erosion, and the moderate available water capacity are the main limitations. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant native trees. Few limitations affect forest management. Trees preferred for planting include slash pine, loblolly pine, southern red oak, and white oak.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife (fig. 9). It has very poor potential for use as habitat for wetland wildlife.

The slope is a moderate limitation on sites for

Figure 9.—This area of Smithdale sandy loam, 8 to 15 percent slopes, is a pipeline right-of-way that has been planted to grasses and legumes for wildlife.

residential buildings and local roads. It is a severe limitation on sites for small commercial buildings. Special design and proper engineering techniques can help to overcome these limitations. The slope is a moderate limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems. This limitation can be overcome by installing field lines on the contour.

The capability subclass is IVe, and the woodland ordination symbol is 9A.

38F1—Smithdale sandy loam, 15 to 40 percent slopes. This well drained, steep soil formed in loamy material. It is on hillsides in highly dissected uplands with prominent local relief. The landscape is characterized by narrow ridgetops, steep side slopes, and narrow drainageways.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 7 inches; dark brown sandy loam

Subsurface layer:
7 to 16 inches; yellowish brown sandy loam

Subsoil:
16 to 37 inches; red sandy clay loam
37 to 72 inches; red loam that has pockets of light yellowish brown sand

Included with this soil in mapping are small areas of

Lexington, Loring, Lorman, Memphis, Providence, and Saffell soils. Lexington and Providence soils are silty in the surface layer and the upper part of the subsoil. The moderately well drained Providence soils are on narrow ridgetops. They have a fragipan. Loring soils are silty and are moderately well drained. Memphis soils are well drained and are on narrow ridgetops. Lorman and Saffell soils are in positions on hillsides similar to those of the Smithdale soil. Lorman soils are clayey, and Saffell soils are gravelly. Also included are small areas of soils that have a sandy surface layer more than 20 inches thick on foot slopes and low interfluve ridges and small areas of loamy and sandy, well drained to somewhat poorly drained soils in narrow drainageways.

Important properties of the Smithdale soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 5 feet
Flooding: None
Root zone: 60 inches or more

Most areas of this soil are used as woodland. A small acreage is used for pasture.

This soil is poorly suited to row crops, truck crops, and small grain because of the slope and the severe hazard of erosion. A permanent cover of grass or trees should be maintained.

This soil is very poorly suited to grasses and legumes for hay and pasture because of the slope, the severe hazard of erosion, and the moderate available water capacity. Because of the slope, plants are difficult to establish and maintain and the use of equipment is restricted.

This soil is suited to woodland. Oaks, pines, and hickories are the dominant native trees (fig. 10). Trees preferred for planting include slash pine, longleaf pine, loblolly pine, and southern red oak. The use of equipment is moderately restricted because of the slope. The hazard of erosion is also a management concern. Roads and log landings can be protected against erosion by constructing diversions and by vegetating cuts and fills. Harvesting methods that minimize the risk of erosion are needed to prevent gullying and offsite sedimentation.

This soil has good potential for use as habitat for woodland wildlife and fair potential for use as habitat for openland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The slope is a severe limitation on sites for residential and small commercial buildings and for local roads. Special design and engineering techniques and proper construction can help to overcome this limitation. The slope is a severe limitation on sites for septic tank absorption fields and subsurface waste-water disposal systems. In areas that have slopes of less than 30 percent, field lines can be installed on the contour. In areas that have slopes of more than 30 percent, alternative waste-water disposal systems may be needed because the effluent from subsurface disposal systems can surface in downslope areas and cause the contamination of ground water.

The capability subclass is VIIe, and the woodland ordination symbol is 9R.

51A1—Providence silt loam, 0 to 2 percent slopes. This moderately well drained, nearly level soil formed in a mantle of loess about 2 feet thick and in the underlying loamy sediments. It is on undulating uplands. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 7 inches; brown silt loam

Subsoil:
7 to 20 inches; strong brown silty clay loam
20 to 34 inches; a firm, brittle, and compact fragipan of mottled yellowish brown, light brownish gray, and strong brown silt loam
34 to 64 inches; a firm, brittle, and compact fragipan of mottled yellowish red, gray, and brown sandy clay loam

Included with this soil in mapping are small areas of Bude, Lexington, and Loring soils. Bude soils are somewhat poorly drained and are in depressions and heads of drainageways. Lexington soils do not have a fragipan. They are in the higher positions on the landscape. Loring soils formed in thick loess. They are in landscape positions similar to those of the Providence soil. Also included are small areas of poorly drained, silty soils in small depressions and small areas of soils that have slopes of 2 to 5 percent.

Important properties of the Providence soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate above the fragipan and moderately slow in the fragipan
Available water capacity: Moderate
Surface runoff: Slow

Figure 10.—An old forest of mixed upland hardwoods and loblolly pine in an area of Smithdale sandy loam, 15 to 40 percent slopes.

Erosion hazard: Moderate

Depth to the water table: Perched above the fragipan at a depth of 1.5 to 3.0 feet during winter and early spring

Flooding: None

Root zone: Restricted at a depth of 1.5 to 3.0 feet because of the compact, brittle fragipan

Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as cropland or pasture. A small acreage is used as woodland.

This soil is well suited to a variety of row crops, truck crops, and small grain. Seasonal wetness is the main limitation. The restricted root zone and the moderate available water capacity are also limitations. Proper row arrangement and surface field ditches can help to control wetness in cultivated areas. Crop rotations that include grasses and legumes help to maintain the content of organic matter and improve soil moisture. Returning crop residue to the soil improves fertility and tilth and minimizes crusting and surface compaction.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also helps to control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and reduces the rate of water infiltration. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, yellow-poplar, and Shumard oak. The seasonal wetness is a moderate concern affecting the use of equipment. Using special equipment and logging during the drier seasons help to

overcome the problems caused by wetness, help to prevent the formation of ruts, and minimize surface compaction. Plant competition is severe. If pine trees are planted, proper site preparation helps to control undesirable species and spraying controls subsequent growth.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The wetness is a moderate limitation on sites for residential and small commercial buildings. Low strength is a severe limitation on sites for local roads. Special design and proper engineering techniques help to overcome these limitations. The wetness and the slow permeability in the fragipan severely limit the use of this soil as a site for septic tank absorption fields or subsurface waste-water disposal systems. Special design of subsurface waste-water disposal systems can help to overcome these limitations, or alternative systems can be used.

The capability subclass is IIw, and the woodland ordination symbol is 9W.

51B2—Providence silt loam, 2 to 5 percent slopes, eroded. This moderately well drained, gently sloping soil formed in a mantle of loess about 2 feet thick and in the underlying loamy sediments. It is on ridgetops in dissected uplands. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:

0 to 6 inches; dark brown silt loam

Subsoil:

6 to 21 inches; yellowish brown silty clay loam

21 to 44 inches; a firm, brittle, and compact fragipan of yellowish brown silt loam that has strong brown, light brownish gray, and pale brown mottles

44 to 64 inches; a firm, brittle, and compact fragipan of mottled yellowish red, strong brown, and light brownish gray clay loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Bude, Kolin, Lexington, and Loring soils. Bude soils are somewhat poorly drained and are in depressions and heads of drainageways. Kolin soils do not have a fragipan and have a high content of clay in the lower part of the subsoil. The well drained Lexington soils are on narrow ridgetops. They do not have a fragipan. Loring soils have a lower content of sand to a depth of 48 inches than the Providence soil. They are in landscape positions similar to those of the Providence soil. Also included are small areas of soils that have slopes of more than 5 percent and a few small areas of severely eroded soils in which the surface layer is mainly made up of subsoil material.

Important properties of the Providence soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed

Permeability: Moderate above the fragipan and moderately slow in the fragipan

Available water capacity: Moderate

Surface runoff: Medium

Erosion hazard: Severe

Depth to the water table: Perched above the fragipan at a depth of 1.5 to 3.0 feet during winter and early spring

Flooding: None

Root zone: Restricted at a depth of 1.5 to 3.0 feet because of the compact, brittle fragipan

Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as cropland or pasture. A small acreage is used as woodland.

This soil is well suited to a variety of row crops, truck crops, and small grain. The hazard of erosion is a major concern. Seasonal wetness, the restricted root zone, and the moderate available water capacity are also limitations. Conservation tillage, terraces, grassed waterways, and contour farming help to control erosion in cultivated areas. Crop rotations help to maintain the content of organic matter and improve soil moisture. Returning crop residue to the soil improves fertility and tilth and minimizes crusting.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also helps to control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, yellow-poplar, and Shumard oak. The seasonal wetness restricts the use of equipment. Using special equipment and logging during the drier seasons help to overcome the problems

caused by wetness, help to prevent the formation of ruts, and minimize surface compaction. Plant competition is severe. If pine trees are planted, proper site preparation can help to control undesirable species and spraying controls subsequent growth.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The wetness is a moderate limitation on sites for residential and small commercial buildings, and low strength is a severe limitation on sites for local roads. Special design and proper engineering techniques can help to overcome these limitations. The seasonal wetness and the slow permeability in the fragipan severely limit the use of this soil as a site for septic tank absorption fields or subsurface waste-water disposal systems. Special design of subsurface waste-water disposal systems can help to overcome these limitations, or alternative systems can be used.

The capability subclass is IIe, and the woodland ordination symbol is 9W.

51C2—Providence silt loam, 5 to 8 percent slopes, eroded. This moderately well drained, moderately sloping soil formed in a mantle of loess about 2 feet thick and in the underlying loamy sediments. It is on side slopes in undulating to rolling uplands and on ridgetops in hilly, dissected uplands. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches; brown silt loam

Subsoil:
5 to 20 inches; strong brown silty clay loam
20 to 35 inches; a firm, brittle, and compact fragipan of strong brown silt loam that has light brownish gray and yellowish brown mottles
35 to 64 inches; a firm, brittle, and compact fragipan of mottled yellowish red, gray, and strong brown clay loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Kolin, Loring, and Smithdale soils. Kolin soils do not have a fragipan and are clayey in the lower part of the subsoil. They are in landscape positions similar to those of the Providence soil. Loring soils formed in thick loess. They are mainly on the broader ridgetops. Smithdale soils are loamy throughout. They are on hillsides. Also included are small areas of soils that have slopes of less than 5 percent and small areas of severely eroded soils in which the surface layer is made up of subsoil material.

Important properties of the Providence soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate above the fragipan and moderately slow in the fragipan
Available water capacity: Moderate
Surface runoff: Medium
Erosion hazard: Severe
Depth to the water table: Perched above the fragipan at a depth of 1.5 to 3.0 feet during winter and early spring
Flooding: None
Root zone: Restricted at a depth of 1.5 to 3.0 feet because of the compact, brittle fragipan
Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as cropland or pasture. A small acreage is used as woodland.

This soil is moderately suited to a variety of row crops, truck crops, and small grain. The hazard of erosion is a major concern. The restricted root zone, the moderate available water capacity, and seasonal wetness are also limitations. Conservation tillage, cover crops, grassed waterways, terraces, contour stripcropping, vegetated filter strips, and contour farming help to control erosion in cultivated areas. Crop rotations help to control erosion, maintain the content of organic matter, and improve soil moisture. Returning crop residue to the soil improves fertility and tilth and minimizes crusting.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also helps to control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, yellow-poplar, and Shumard oak. The seasonal wetness limits the use of equipment, and the hazard of erosion is an important management concern. Plant competition is severe. Using equipment only during the drier periods helps to overcome the problems caused by wetness, helps to

prevent the formation of ruts, and minimizes surface compaction. Site preparation helps to control competition from undesirable species in areas where pine trees are being established.

This soil has good potential for use as habitat for openland wildlife (fig. 11) and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

This soil is moderately suited to residential and small commercial buildings. The seasonal wetness is a moderate limitation on sites for residential development. The wetness and the slope are moderate limitations on sites for small commercial buildings. Low strength is a severe limitation on sites for local roads and streets. Special design and proper construction techniques help to overcome these limitations. The slow permeability in the fragipan and the seasonal wetness severely limit the use of this soil as a site for septic tank absorption fields or subsurface waste-water disposal systems.

The capability subclass is IIIe, and the woodland ordination symbol is 9W.

53—Providence silt loam, 2 to 8 percent slopes, eroded. This moderately well drained, nearly level to sloping soil formed in a mantle of loess about 2 feet thick and in the underlying loamy sediments. It is on narrow or broad ridgetops and shoulder slopes in dissected uplands. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:

0 to 5 inches; dark grayish brown silt loam

Subsoil:

5 to 22 inches; strong brown silty clay loam

22 to 40 inches; a firm, brittle, and compact fragipan of strong brown silt loam that has light brownish gray, brownish yellow, and yellowish brown mottles

40 to 64 inches; a firm, brittle, and compact fragipan of mottled yellowish red, gray, and strong brown loam

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the surface layer is the original topsoil, and in other areas the surface layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Kolin, Loring, Saffell, and Smithdale soils. Kolin soils do not have a fragipan and are clayey in the lower part of the subsoil. They are in landscape positions similar to those of the Providence soil. Loring soils have less than 15 percent sand to a depth of more than 48 inches. Saffell and Smithdale soils are in the lower positions on hillsides. Saffell soils have a high content of gravel, and Smithdale soils are loamy throughout. Also included are some small areas of severely eroded soils and some areas that have some shallow gullies and a few deep gullies.

Important properties of the Providence soil—

Soil reaction: Very strongly acid to medium acid throughout the profile

Permeability: Moderate above the fragipan and moderately slow in the fragipan

Available water capacity: Moderate

Surface runoff: Medium

Erosion hazard: Severe

Depth to the water table: Perched above the fragipan at a depth of 1.5 to 3.0 feet during winter and early spring

Flooding: None

Root zone: Restricted at a depth of 1.5 to 3.0 feet because of the compact, brittle fragipan

Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as woodland.

This soil is moderately suited to a variety of row crops, truck crops, and small grain. The hazard of erosion is a major management concern. Seasonal wetness, the restricted root zone, and the moderate available water capacity are also limitations. Conservation tillage, cover crops, grassed waterways, terraces, contour stripcropping, and contour farming help to control erosion in cultivated areas. Crop rotations help to maintain the content of organic matter, improve soil moisture, and help to control erosion. Returning crop residue to the soil improves fertility and tilth and minimizes crusting and surface compaction.

This soil is well suited to grasses and legumes for hay and pasture. Growing grasses and legumes also helps to control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include sweetgum, loblolly pine, yellow-poplar, and Shumard oak. The seasonal wetness restricts the use of equipment, and the hazard of erosion is an important management concern. Plant competition is severe. Using equipment only during the drier periods

Figure 11.—Chufa in an area of Providence silt loam, 5 to 8 percent slopes, eroded. This plant is a food source for wild turkeys.

helps to overcome the problems caused by wetness, helps to prevent the formation of ruts, and minimizes surface compaction. Site preparation helps to control competition from undesirable species in areas where pine trees are being established.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

This soil is moderately suited to residential and small commercial buildings. The seasonal wetness is a moderate limitation on sites for residential development. The wetness and the slope are moderate limitations on sites for small commercial buildings. Low strength is a severe limitation on sites for local roads and streets. Special design and proper construction techniques help to overcome these limitations. The slow permeability in the fragipan and the seasonal wetness severely limit the use of this soil as a site for septic tank absorption fields or subsurface waste-water disposal systems.

The capability subclass is IIIe, and the woodland ordination symbol is 9W.

54—Kolin silt loam, 2 to 8 percent slopes, eroded. This gently sloping to sloping, moderately well drained soil formed in deposits of loess less than 3 feet thick and in the underlying clayey sediments. It is on ridgetops in dissected uplands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
- 0 to 5 inches; dark brown silt loam

Subsoil:
- 5 to 23 inches; strong brown silty clay loam
- 23 to 29 inches; yellowish brown silt loam that has strong brown mottles
- 29 to 42 inches; red clay that has strong brown and grayish brown mottles
- 42 to 62 inches; yellowish brown silty clay that has dark grayish brown and gray mottles

In most areas, part of the original surface layer has been removed by erosion and tillage has mixed the remaining topsoil with the subsoil. In some small areas all of the plow layer is the original topsoil, and in other areas the plow layer is essentially in the subsoil. A few rills and shallow gullies are in some areas.

Included with this soil in mapping are small areas of Lexington, Lorman, Providence, and Smithdale soils. Lexington soils are loamy in the lower part of the subsoil. They are in landscape positions similar to those of the Kolin soil. Lorman soils have a high content of clay throughout the subsoil. They are in the lower positions on hillsides. Providence soils have a fragipan and are loamy in the lower part of the subsoil. They are in landscape positions similar to those of the Kolin soil. Smithdale soils are loamy throughout. They are in the lower positions on hillsides. Also included are a few small areas of soils that have silty material as much as 50 inches thick.

Important properties of the Kolin soil—

Soil reaction: Strongly acid to slightly acid in the surface layer, except in areas that have been limed; very strongly acid to medium acid in the upper part of the subsoil; very strongly acid to slightly acid in the lower part of the subsoil
Permeability: Moderately slow in the upper part of the subsoil and very slow in the lower, clayey part
Available water capacity: High
Surface runoff: Medium
Erosion hazard: Severe
Depth to the water table: Perched above the clayey material at a depth of 1.5 to 3.0 feet during winter and early spring
Flooding: None
Root zone: Somewhat restricted at a depth of 1.5 to 3.0 feet because of the seasonal high water table and the clayey subsoil
Tilth: The surface layer is friable and can be easily tilled throughout a fairly wide range in moisture content, but it tends to crust and pack after hard rains.

Most areas of this soil are used as woodland.

This soil is poorly suited to row crops, truck crops, and small grain because of the hazard of erosion. Seasonal wetness also is a concern. Conservation tillage, grassed waterways, terraces, and contour farming help to control erosion in cultivated areas. Crop rotations help to control erosion, maintain the content of organic matter, and improve soil moisture. Returning crop residue to the soil improves fertility and tilth and minimizes crusting.

This soil is moderately suited to grasses and legumes for hay and pasture. Growing grasses and legumes also helps to control erosion. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is moderately suited to woodland. Pines and oaks in mixed stands are the dominant native trees. Trees preferred for planting include slash pine, loblolly pine, and sweetgum. If pine trees are planted, plant competition is severe. Site preparation can help to control undesirable species, and spraying controls subsequent growth. Using equipment only during the drier periods reduces the hazard of erosion, helps to prevent the formation of ruts, and minimizes surface compaction.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The shrink-swell potential is a severe limitation on sites for residential and small commercial buildings. Low strength is a severe limitation on sites for local roads. These limitations can be partially overcome by special design, special engineering techniques, and proper construction. The seasonal wetness and the very slow permeability in the lower part of the subsoil are severe limitations on sites for septic tank absorption fields and subsurface waste-water disposal systems. Special designs can help to overcome these limitations, or alternative systems can be used.

The capability subclass is IVe, and the woodland ordination symbol is 8A.

56A—Bude silt loam, 0 to 2 percent slopes. This somewhat poorly drained soil formed in a thin mantle of silty material and in the underlying loamy sediments. It

is on broad, nearly level uplands and old stream terraces. It has a fragipan.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches; dark brown silt loam

Subsoil:
5 to 11 inches; mottled brown, light brownish gray, and light yellowish brown silt loam
11 to 19 inches; light yellowish brown silt loam that has gray and strong brown mottles
19 to 24 inches; mottled pale brown, yellowish brown, and strong brown silt loam
24 to 43 inches; a firm, brittle, and compact fragipan of mottled strong brown, light brownish gray, and yellowish brown silt loam
43 to 63 inches; a firm, brittle, and compact fragipan of mottled strong brown, light brownish gray, and light gray loam

Included with this soil in mapping are small areas of Gillsburg and Providence soils. Gillsburg soils are on narrow flood plains. The moderately well drained Providence soils are in the slightly higher positions. Also included are a few small areas of the poorly drained Trebloc soils in depressions that are flooded during wet seasons.

Important properties of the Bude soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate above the fragipan and slow in the fragipan
Available water capacity: Moderate
Surface runoff: Slow
Erosion hazard: Moderate
Depth to the water table: Perched above the fragipan at a depth of 0.5 foot to 1.5 feet in winter and early spring
Flooding: None
Root zone: Restricted at a depth of about 19 inches because of the brittle and compact fragipan
Tilth: The surface layer is friable and can be easily worked during the drier seasons, but it tends to crust and pack after hard rains.

Most areas of this soil are used as cropland or pasture. A small acreage is used as woodland.

This soil is moderately suited to a variety of row crops, truck crops, and small grain. Seasonal wetness is the main limitation. It delays planting in the spring and frequently results in poor stands. The fragipan in the subsoil restricts the penetration of roots and reduces the available water capacity during the growing season. Row arrangement and surface field ditches can remove excess surface water in low areas. Using a system of conservation tillage, planting cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil improve fertility and tilth and minimize crusting and surface compaction.

This soil is well suited to grasses and legumes for hay and pasture. Excessive wetness is the major limitation affecting forage production. Prolonged periods of wetness can kill or weaken stands of pasture grasses. Also, forage production may decline significantly during droughty periods in the summer. Grazing when the soil is too wet causes surface compaction. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Oaks, pines, and hickories are the dominant trees. Trees preferred for planting include loblolly pine, sweetgum, cherrybark oak, and southern red oak. The seasonal wetness restricts the use of equipment. Using special equipment and logging during the drier seasons help to overcome the problems caused by wetness, help to prevent the formation of ruts, and minimize surface compaction. Plant competition is severe if pine trees are planted. Proper site preparation helps to control undesirable species, and spraying controls subsequent growth.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife and fair potential for use as habitat for wetland wildlife.

The wetness is a severe limitation on sites for residential and small commercial buildings. The wetness and low strength are severe limitations on sites for local roads. Special design and engineering techniques and proper construction help to overcome these limitations. The slow permeability in the fragipan and the seasonal high water table are severe limitations on sites for septic tank absorption fields and subsurface waste-water disposal systems. Alternative sites can be selected, or a specially designed system can be used.

The capability subclass is IIw, and the woodland ordination symbol is 10W.

69F—Smithdale-Lexington association, 5 to 40 percent slopes. This map unit consists of well drained soils in highly dissected, rugged, hilly uplands. Individual areas are characterized by narrow to broad ridgetops and sloping to steep hillsides. They are dissected by a highly developed dendritic drainage pattern. They are irregular in shape and range from 160 to more than 800 acres in size. The Smithdale soil formed in loamy material. It is on hillsides and ridgetops and has slopes that are dominantly 12 to 35 percent but

range from 8 to 40 percent. The Lexington soil formed in loess about 2 to 3 feet thick and in the underlying loamy material. It is on narrow, winding, gently sloping to strongly sloping ridgetops and has slopes that are dominantly 5 to 12 percent but range from 5 to 20 percent.

The soils in this map unit occur in a regular and repeating pattern. The Smithdale soil makes up about 55 percent of the unit, the Lexington soil makes up 20 percent, and included soils make up 25 percent.

Included with these soils in mapping are areas of Kolin, Loring, Lorman, and Saffell soils. Kolin and Loring soils are in landscape positions similar to those of the Lexington soils. The moderately well drained Kolin soils have a high content of clay in the subsoil. The silty Loring soils have a fragipan. Lorman and Saffell soils are in landscape positions similar to those of the Smithdale soil. Lorman soils have a high content of clay, and Saffell soils have a high content of gravel. Also included are soils that have a sandy surface layer more than 20 inches thick, on some of the hillsides, and loamy soils that are mainly well drained and moderately well drained, on narrow flood plains and in drainageways.

The typical sequence, depth, and composition of the layers of the Smithdale soil are as follows—

Surface layer:
0 to 6 inches; dark grayish brown sandy loam

Subsurface layer:
6 to 10 inches; pale brown sandy loam

Subsoil:
10 to 42 inches; yellowish red sandy clay loam
42 to 80 inches; yellowish red sandy loam that has pockets of pale brown sand

Important properties of the Smithdale soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Very rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: 60 inches or more

The typical sequence, depth, and composition of the layers of the Lexington soil are as follows—

Surface layer:
0 to 6 inches; brown silt loam

Subsoil:
6 to 31 inches; dark brown silty clay loam
31 to 50 inches; strong brown sandy loam
50 to 80 inches; yellowish red sandy loam

Important properties of the Lexington soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate in the upper part of the subsoil and moderately rapid in the lower part
Available water capacity: Moderate
Surface runoff: Medium
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: 60 inches or more

Most areas of these soils are used as woodland. A small acreage is used for grasses and legumes for hay and pasture.

These soils are poorly suited to row crops, truck crops, and small grain because of the rugged terrain and the slope. The hazard of erosion is severe. Maintaining a permanent cover of plants, especially trees, helps to control erosion. Pasture and hay crops can be grown on the gently sloping and sloping ridgetops. Proper stocking rates, controlled grazing, and weed and brush control reduce the runoff rate and the hazard of erosion.

These soils are well suited to woodland. Oaks, pines, and hickories are the dominant trees in wooded areas. Trees preferred for planting include slash pine, longleaf pine, southern red oak, loblolly pine, and cherrybark oak. Because of the slope, the erosion hazard and the equipment limitation are moderate concerns. If pine trees are planted on the Lexington soil, plant competition is severe. Proper harvesting methods can minimize the risk of erosion. Establishing logging roads parallel to the slope helps to prevent the formation of gullies. Roads and log landings can be protected against erosion by constructing diversions and by vegetating cuts and fills. Conventional harvesting methods can be used in most areas but may not be practical in the steeper areas. If pine trees are planted on the Lexington soil, site preparation is needed to control competition from undesirable plants.

These soils have fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. They have very poor potential for use as habitat for wetland wildlife.

The slope is generally a severe limitation on sites for residential and small commercial buildings. Gently

sloping to sloping areas of the Lexington soil are moderately suited to residential development. Low strength is a severe limitation if the Lexington soil is used as a site for local roads. Special design and proper construction techniques can help to overcome the slope and the low strength. If the Smithdale soil is used as a site for septic tank absorption fields or waste-water disposal systems, the slope is a severe limitation. In areas that have slopes of less than 30 percent, this limitation can be partially overcome by installing field lines on the contour. In areas that have slopes of more than 30 percent, alternative waste-water disposal systems are needed because the effluent from subsurface systems can surface in downslope areas and cause the contamination of ground water. The limitations affecting waste-water disposal systems are slight in areas of the Lexington soil that have slopes of less than 15 percent.

The capability subclass of the Smithdale soil is VIIe, and that of the Lexington soil is VIe. The woodland ordination symbol is 9R for the Smithdale soil and 10R for the Lexington soil.

70F—Smithdale-Lexington-Memphis association, 5 to 40 percent slopes. This map unit consists of well drained soils in areas of very hilly and rugged terrain in the uplands. Individual areas are characterized by many narrow and some broad ridgetops above sloping to very steep hillsides. They are dissected by a deeply entrenched dendritic drainage pattern. They are irregular in shape and range from 160 to 800 acres in size. The Smithdale soil formed in loamy material. It is on sloping to steep hillsides and has slopes that range mainly from 12 to 40 percent. The Lexington soil formed in loess about 2 to 3 feet thick and in the underlying loamy sediments. It is on gently sloping to strongly sloping, winding ridgetops and has slopes that range from 5 to 12 percent. The Memphis soil formed in loess more than 4 feet thick. It is mainly on some of the broader ridgetops and on shoulder slopes and has slopes that range from 5 to 15 percent.

The soils in this map unit occur in a regular and repeating pattern on the ridgetops and hillsides, but onsite investigation is required to identify the location of each component. The Smithdale soil makes up about 40 percent of the unit, the Lexington soil makes up 20 percent, the Memphis soil makes up 15 percent, and included soils make up 25 percent.

Included with these soils in mapping are areas of Kolin, Loring, and Lorman soils and soils on flood plains and in drainageways. Kolin soils have a high content of clay in the subsoil. They are on ridgetops. The moderately well drained Loring soils are mainly on ridgetops near areas of the Memphis soil. They have a fragipan. Lorman soils have a clayey subsoil. They are on hillsides. Most of the soils on flood plains and in drainageways are well drained or moderately well drained. They range in texture from sandy to silty. Also included are some severely eroded areas and areas of soils in which natural drainageways have developed into gullies as much as 25 feet deep. These gullies are the result of accelerated runoff caused by logging or farming activities.

The typical sequence, depth, and composition of the layers of the Smithdale soil are as follows—

Surface layer:
0 to 2 inches; very dark grayish brown sandy loam

Subsurface layer:
2 to 11 inches; light yellowish brown sandy loam

Subsoil:
11 to 32 inches; yellowish red sandy clay loam
32 to 72 inches; yellowish red sandy loam that has pockets of light yellowish brown sand

Important properties of the Smithdale soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Very rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: 60 inches or more

The typical sequence, depth, and composition of the layers of the Lexington soil are as follows—

Surface layer:
0 to 5 inches; brown silt loam

Subsurface layer:
5 to 12 inches; light yellowish brown silt loam

Subsoil:
12 to 36 inches; dark brown silty clay loam
36 to 48 inches; strong brown sandy loam
48 to 62 inches; yellowish red sandy loam

Important properties of the Lexington soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate in the upper part of the subsoil and moderately rapid in the lower part
Available water capacity: Moderate
Surface runoff: Medium

Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: 60 inches or more

The typical sequence, depth, and composition of the layers of the Memphis soil are as follows—

Surface layer:
0 to 6 inches; brown silt loam

Subsoil:
6 to 42 inches; dark brown silt loam

Underlying material:
42 to 80 inches; strong brown silt loam

Important properties of the Memphis soil—

Soil reaction: Very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: High
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: 60 inches or more

Most areas of these soils are used as woodland. A small acreage is used for grasses and legumes for hay and pasture.

These soils are poorly suited to row crops, truck crops, and small grain because of the rugged, dissected landscape and the slope. The hazard of erosion is severe. Maintaining a permanent cover of plants, especially trees, helps to control erosion. Grasses can be grown for pasture or hay in the gently sloping and sloping areas on ridgetops. Overgrazing causes excessive runoff and increases the hazard of erosion. Proper stocking rates, controlled grazing, and weed and brush control reduce the runoff rate and the hazard of erosion.

These soils are well suited to woodland. Oaks, pines, and hickories are the dominant trees in wooded areas. Trees preferred for planting include slash pine, longleaf pine, loblolly pine, southern red oak, and cherrybark oak. Because of the slope, the equipment limitation is moderate. Erosion is also a management concern. If pine trees are planted on the Lexington and Memphis soils, plant competition is severe. Proper harvesting methods can minimize the risk of erosion. Roads and log landings can be protected against erosion by constructing diversions and by vegetating cuts and fills. Also, constructing roads parallel to the slope helps to prevent the formation of gullies. Conventional harvesting methods can be used in most areas but may not be practical in the steeper areas. If pine trees are planted on the Lexington and Memphis soils, site preparation is needed to control competition from undesirable plants.

These soils have fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. They have very poor potential for use as habitat for wetland wildlife.

The slope is generally a severe limitation on sites for residential and small commercial buildings. Gently sloping to sloping areas of the Lexington and Memphis soils on ridgetops are moderately suited to these uses. If the Lexington and Memphis soils are used for local roads and streets, low strength is a severe limitation. The slope is a severe limitation affecting this use in areas of the Smithdale soil. Special design, special engineering techniques, and proper construction methods help to overcome some of these limitations. In areas that have slopes of less than 15 percent, mainly areas of the Lexington and Memphis soils on ridgetops, the limitations affecting septic tank absorption fields and subsurface waste-water disposal systems are slight. The limitations are severe in areas that have slopes of more than 15 percent. In areas that have slopes of less than 30 percent, field lines can be installed on the contour. In areas that have slopes of more than 30 percent, alternative waste-water disposal systems are needed because the effluent from subsurface systems can surface in downslope areas and cause the contamination of ground water.

The capability subclass of the Smithdale soil is VIIe, and that of the Lexington and Memphis soils is VIe. The woodland ordination symbol is 9R for the Smithdale soil, 10R for the Lexington soil, and 12R for the Memphis soil.

72F1—Saffell gravelly sandy loam, 15 to 40 percent slopes. This well drained, moderately steep and steep soil formed in gravelly, loamy and sandy sediments. It is on hillsides in areas of hilly and rugged terrain on uplands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches; brown gravelly sandy loam

Subsurface layer:
4 to 8 inches; yellowish brown gravelly sandy loam

Subsoil:
8 to 20 inches; strong brown very gravelly sandy clay loam
20 to 32 inches; yellowish red very gravelly loam

32 to 50 inches; strong brown very gravelly sandy loam

Underlying material:
50 to 75 inches; red very gravelly sandy loam

Included with this soil in mapping are small areas of Lorman and Smithdale soils. These soils are in landscape positions similar to those of the Saffell soil. Lorman soils are clayey, and Smithdale soils are loamy. Also included are a few pits and some soils that have a thick, sandy surface layer.

Important properties of the Saffell soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Low
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Deep

Most areas of this soil are used as woodland. A small acreage is used for pasture.

This soil is unsuited to row crops, small grain, and truck crops because of the slope, the severe hazard of erosion, low productivity, and the high content of gravel. Maintaining a permanent cover of trees or grasses helps to control erosion.

This soil is very poorly suited to grasses and legumes for hay and pasture because of the severe hazard of erosion, the slope, the low productivity, and droughtiness. Maintaining a permanent cover of plants, especially trees, helps to control erosion.

This soil is suited to woodland. The potential productivity of preferred trees is limited by the low available water capacity. Drought-tolerant oaks and hickories intermingled with pines are the dominant trees in wooded areas. Trees preferred for planting include loblolly pine, shortleaf pine, and southern red oak. The slope limits the use of equipment. Because of the low available water capacity, seedling mortality is a moderate concern. Conventional harvesting methods can be used in the less sloping areas but may not be practical in the steeper areas. Proper management methods minimize the risk of erosion and help to prevent the formation of gullies. Planting pine trees in winter so that the seedlings can become established before the droughty conditions occur reduces the seedling mortality rate.

This soil has poor potential for use as habitat for openland wildlife and fair potential for use as habitat for woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The slope is a severe limitation on sites for residential and small commercial buildings and for local roads. The high content of gravel in the soil is an additional concern. Special design and proper construction techniques help to overcome these limitations. The slope is a severe limitation affecting septic tank absorption fields and waste-water disposal systems. In areas that have slopes of less than 30 percent, field lines can be installed on the contour. In areas that have slopes of more than 30 percent, special design may be needed or alternative systems can be used. The effluent from subsurface waste-water disposal systems can surface in downslope areas and cause the contamination of ground water.

The capability subclass is VIIe, and the woodland ordination symbol is 6R.

73D1—Lorman silt loam, 8 to 15 percent slopes. This moderately well drained, sloping to moderately steep soil formed in interbedded clayey and silty marine sediments. It is on hillsides in rolling landscapes and also on the crests of ridges in areas of rugged and hilly terrain on uplands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches; dark grayish brown silt loam

Subsoil:
3 to 14 inches; red clay that has pale brown and yellowish red mottles
14 to 42 inches; yellowish red clay that has light brownish gray and yellowish brown mottles

Underlying material:
42 to 64 inches; light brownish gray, thinly bedded silty clay loam that has strata of silt loam, clay, and silt and has many fragments of weakly indurated siltstone

Included with this soil in mapping are small areas of Gillsburg, Providence, and Smithdale soils. Gillsburg soils have a high content of silt. They are somewhat poorly drained and are in narrow drainageways. Providence soils have a fragipan and have a high content of silt in the upper 48 inches. They are moderately well drained and are on narrow ridgetops. The loamy Smithdale soils are well drained and are in landscape positions similar to those of the Lorman soil. Also included are small areas of soils that have a thick, sandy surface layer.

Important properties of the Lorman soil—

Soil reaction: Very strongly acid to slightly acid in the surface layer, except in areas that have been limed; strongly acid to mildly alkaline in the subsoil; medium acid to mildly alkaline in the underlying material
Permeability: Very slow
Available water capacity: High
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Somewhat restricted because of the firm, sticky and plastic, clayey subsoil

Most areas of this soil are used as woodland. A small acreage is used as pasture or cropland.

This soil is poorly suited to row crops, truck crops, and small grain because of the slope, the erosion hazard, and the clayey texture. Maintaining a permanent cover of trees helps to control erosion.

This soil is poorly suited to grasses and legumes for hay and pasture because of low productivity, the slope, and the erosion hazard. Shallow gullies tend to form where animal trails have broken the sod in the steeper areas. Overgrazing or grazing when the soil is too wet causes surface compaction, reduces the rate of water infiltration, and increases the runoff rate. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is suited to woodland. Oaks, pines, and hickories are the dominant trees in wooded areas. Trees preferred for planting include loblolly pine, slash pine, shortleaf pine, and southern red oak. The use of equipment is somewhat restricted because of the clayey texture, which makes the soil sticky and plastic when wet. Logging only during the drier seasons helps to overcome this limitation.

This soil has good potential for use as habitat for openland wildlife and woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The shrink-swell potential is a severe limitation on sites for residential and small commercial buildings. The slope is an additional limitation on sites for small commercial buildings. Low strength and the shrink-swell potential are severe limitations on sites for local roads. Special design and proper construction techniques help to overcome some of these limitations. The very slow permeability in the clayey subsoil severely limits the use of this soil as a site for septic tank absorption fields or waste-water disposal systems. Special design may be needed, or alternative sites can be selected.

The capability subclass is VIe, and the woodland ordination symbol is 8C.

73F1—Lorman silt loam, 15 to 35 percent slopes. This moderately well drained, moderately steep and steep soil formed in interbedded clayey and silty marine sediments. It is on hillsides in areas of rugged, dissected terrain on uplands. Land slumps and slope failure are prominent features in many areas on the steeper slopes.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 2 inches; very dark grayish brown silt loam

Subsurface layer:
2 to 5 inches; dark grayish brown silty clay loam

Subsoil:
5 to 10 inches; yellowish red clay
10 to 16 inches; yellowish red silty clay that has strong brown, brown, and red mottles
16 to 27 inches; mottled strong brown, red, pale brown, and light brownish gray silty clay loam
27 to 53 inches; light brownish gray silty clay loam that has yellowish red mottles in the upper part and reddish yellow and reddish brown mottles in the lower part

Underlying material:
53 to 64 inches; light brownish gray, soft, thinly bedded silt that has laminae of silt loam, silty clay loam, weakly indurated siltstone, and clay

Included with this soil in mapping are small areas of Kolin, Saffell, and Smithdale soils. Kolin soils have a high content of silt in the surface layer and the upper part of the subsoil. They are on ridgetops. Saffell and Smithdale soils are in landscape positions similar to those of the Lorman soil. Saffell soils are gravelly throughout, and Smithdale soils are loamy. Also included are small areas of soils that have a thick, sandy surface layer and some areas that have slopes of more than 35 percent. Landslides are a common feature in these areas (fig. 12).

Important properties of the Lorman soil—

Soil reaction: Very strongly acid to slightly acid in the surface layer, except in areas that have been limed; strongly acid to mildly alkaline in the subsoil; medium acid to mildly alkaline in the underlying material
Permeability: Very slow
Available water capacity: High
Surface runoff: Very rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet

Figure 12.—Large pine trees tilted and partially uprooted by a landslide in an area of Lorman silt loam, 15 to 35 percent slopes.

Flooding: None

Root zone: Somewhat restricted because of the firm, sticky and plastic, clayey subsoil

Most areas of this soil are used as woodland. A small acreage is used as pasture or cropland.

This soil is unsuited to row crops, truck crops, and small grain because of the slope, low productivity, and the hazard of erosion. Maintaining a permanent cover of trees helps to control runoff and erosion.

This soil is poorly suited to grasses and legumes for hay and pasture because of the low productivity, the slope, and the hazard of erosion. Shallow gullies tend to form where animal trails have broken the sod in the steeper areas. Overgrazing or grazing when the soil is too wet causes surface compaction, which reduces the rate of water infiltration and increases the runoff rate. The slope restricts the use of equipment for weed and brush control.

This soil is suited to woodland. Oaks, pines, and

hickories are the dominant trees (fig. 13). Trees preferred for planting include loblolly pine, shortleaf pine, slash pine, and southern red oak. The use of equipment is restricted because of the clayey texture, the hazard of erosion, and the slope. Because the soil is sticky when wet, planting and harvesting equipment should be used only during the drier seasons. Harvesting methods that minimize the risk of erosion are needed to prevent gullying and offsite sedimentation.

This soil has fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. It has very poor potential for use as habitat for wetland wildlife.

The shrink-swell potential, the slope, and low strength are severe limitations on sites for residential and small commercial buildings and for local roads. Special design, special engineering techniques, and proper construction methods help to overcome some of these limitations. The slope and the very slow permeability in the clayey subsoil severely limit the use of this soil as a site for septic tank absorption fields or waste-water disposal systems. Alternative sites should be selected, or a specially designed alternative system can be used.

The capability subclass is VIIe, and the woodland ordination symbol is 8R.

78F—Lorman and Smithdale soils, 15 to 35 percent slopes. This map unit consists of the moderately well drained Lorman soil and the well drained Smithdale soil. These soils are in areas of rugged and hilly terrain on uplands. The landscape is characterized by narrow, winding ridges and steep hillsides. Individual areas range from about 160 to 800 acres in size. They are deeply dissected by a strongly developed dendritic drainage pattern. The Lorman soil formed in interbedded clayey and silty marine sediments. The Smithdale soil formed in loamy marine sediments.

The soils in this unit do not occur in a regular or repeating pattern. They are intermixed on steep hillsides and long, narrow, winding ridgetops. Onsite investigation is required to identify the location of each component. In areas of the Lorman soil that have slopes of more than 20 percent, slope failure or landslides are common. The Lorman soil makes up about 50 percent of the unit, the Smithdale soil makes up 35 percent, and included soils make up 15 percent.

Included with these soils in mapping are areas of Gillsburg, Oaklimeter, and Providence soils. The somewhat poorly drained Gillsburg and moderately well drained Oaklimeter soils are on flood plains and in narrow drainageways. They have a high content of silt. Providence soils have a high content of silt in the upper 48 inches and have a fragipan. They are moderately well drained and are on narrow, winding ridgetops.

The typical sequence, depth, and composition of the layers of the Lorman soil are as follows—

Surface layer:
0 to 5 inches; brown silt loam

Subsoil:
5 to 28 inches; red clay that has light brownish gray mottles
28 to 45 inches; light brownish gray clay that has yellowish red mottles

Underlying material:
45 to 64 inches; thinly bedded, light brownish gray silty clay loam that has discontinuous strata of silt, clay, and weakly consolidated siltstone and has strong brown and yellowish brown mottles

Important properties of the Lorman soil—

Soil reaction: Very strongly acid to slightly acid in the surface layer, except in areas that have been limed; strongly acid to mildly alkaline in the subsoil; medium acid to mildly alkaline in the underlying material
Permeability: Very slow
Available water capacity: High
Surface runoff: Rapid
Erosion hazard: Severe
Depth to the water table: More than 6 feet
Flooding: None
Root zone: Somewhat restricted because of the firm, sticky and plastic subsoil

The typical sequence, depth, and composition of the layers of the Smithdale soil are as follows—

Surface layer:
0 to 3 inches; dark grayish brown sandy loam

Subsurface layer:
3 to 12 inches; light yellowish brown sandy loam

Subsoil:
12 to 40 inches; yellowish red sandy clay loam
40 to 80 inches; yellowish red sandy loam

Important properties of the Smithdale soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Erosion hazard: Severe

Figure 13.—A good stand of longleaf pine of intermediate age in an area of Lorman silt loam, 15 to 35 percent slopes.

Depth to the water table: More than 6 feet
Flooding: None
Root zone: 60 inches or more

Most areas of these soils are used as woodland.

These soils are unsuited to cultivated crops, truck crops, and small grain and to grasses and legumes for hay and pasture because of the slope, low productivity, and the severe hazard of erosion. Maintaining a permanent cover of plants, especially trees, helps to control erosion. If the soils are used for pasture, proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition. The slope restricts the use of equipment.

These soils are suited to woodland. Oaks, pines, and hickories are the dominant native trees. Trees preferred for planting include loblolly pine, longleaf pine, slash pine, shortleaf pine, and southern red oak. The slope is a limitation affecting the use of equipment. The clayey texture of the Lorman soil also restricts the use of

equipment during wet seasons. Logging only during the drier seasons helps to overcome this limitation.

These soils have fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife. They have very poor potential for use as habitat for wetland wildlife.

The slope is a severe limitation on sites for residential and small commercial buildings and for local roads. The shrink-swell potential of the Lorman soil is a severe limitation affecting the stability of foundations and pavement. Special design, special engineering techniques, and proper construction methods help to overcome these limitations. The slope and the very slow permeability in the lower part of the subsoil in the Lorman soil are severe limitations affecting septic tank absorption fields and waste-water disposal systems. Alternative sites should be selected, or a specially designed system can be used. In areas of the Smithdale soil that have slopes of less than 30 percent, field lines can be installed on the contour.

The capability subclass is VIIe. The woodland ordination symbol is 8R for the Lorman soil and 9R for the Smithdale soil.

80—Riverwash. This map unit consists of frequently flooded areas of unstabilized sandy or gravelly sediments along the Homochitto River. These areas support little or no vegetation. They are often washed and reworked by flooding. The shape or size of individual areas may change as the material is reworked.

Riverwash consists of sand and gravel bars within the confines of the main stream channels. During dry seasons, the areas of riverwash are above the water. During late winter and early spring and during periods of heavy rainfall, however, they are underwater. They are mainly barren, except for clumps of willow bushes in sloughs and drought-tolerant plants, such as scraggy sycamore trees, in some of the higher areas that are less susceptible to flooding. The areas range in size from a few acres to more than 100 acres. They are as much as a mile in length and as much as 1,500 feet wide in some places.

Riverwash is not suited to crops, to grasses and legumes for pasture, or to trees. It is not suited to urban uses. In some areas it is mined as a source of sand or gravel. During the summer it is well suited to various types of recreation, such as sunbathing, camping, picnicking, fishing, and hiking. It is also used as a site for the operation of offroad recreational vehicles.

No capability subclass or woodland ordination symbol is assigned.

94—Trebloc silt loam, frequently flooded. This nearly level, poorly drained soil formed in alluvium that has a high content of silt and clay. It is on broad, depressional flats on old stream terraces. Most areas are susceptible to flooding several times each year. The flooding is of brief or long duration. Slopes are 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches; dark grayish brown silt loam

Subsurface layer:
3 to 9 inches; light brownish gray silt loam that has yellowish brown, dark yellowish brown, and strong brown mottles

Subsoil:
9 to 21 inches; light brownish gray silty clay loam that has yellowish brown mottles
21 to 62 inches; light gray silty clay that has strong brown and yellowish brown mottles

Included with this soil in mapping are small areas of Gillsburg, Oaklimeter, and Ochlockonee soils. These soils are in the slightly higher positions on flood plains. Gillsburg soils are somewhat poorly drained, Oaklimeter soils are moderately well drained, and Ochlockonee soils are well drained and loamy. Also included are small areas of the somewhat poorly drained Bude soils in the slightly higher positions on stream terraces, a few areas of poorly drained soils that have a high sodium concentration in the subsoil, and a few small areas of poorly drained soils on flood plains that have a surface layer of loam or fine sandy loam.

Important properties of the Trebloc soil—

Soil reaction: Very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed
Permeability: Moderately slow
Available water capacity: High
Surface runoff: Slow
Erosion hazard: Slight
Depth to the water table: 0.5 foot to 1.5 feet
Flooding: Frequent, for brief or long periods after heavy rains in winter and early spring
Root zone: Deep; restricted by the seasonal high water table at or near the surface during winter and spring

Most areas of this soil are used as woodland. A small acreage is used for pasture.

This soil is poorly suited to row crops, truck crops,

and small grain because of wetness and the flooding. These limitations can be partially overcome by installing a specially designed drainage and levee system. Regulations concerning drainage should be investigated before any drainage work is considered.

This soil is moderately suited to pasture grasses that are tolerant of wetness. Drainage ditches can remove surface water during the growing season. Plant stands can be damaged or destroyed by flooding early in the growing season. Overgrazing or grazing when the soil is too wet causes surface compaction and poor tilth. Proper stocking rates, controlled grazing, and weed and brush control help to keep the pasture in good condition.

This soil is well suited to woodland. Bottom-land hardwoods are the dominant trees, and swamp hardwoods are in the wetter, low areas. Trees preferred for planting include green ash, loblolly pine, sweetgum, water oak, and willow oak. The flooding and the wetness are the main limitations. The use of equipment is limited to the drier seasons. Also, seedling mortality and plant competition are severe. If pine trees are planted, site preparation is needed to control competition from undesirable plants.

This soil has fair potential for use as habitat for openland wildlife and woodland wildlife. It has good potential for use as habitat for wetland wildlife.

This soil is not suited to residential or small commercial buildings or to septic tank absorption fields or subsurface waste-water disposal systems because of the wetness and the flooding. Flood-control measures generally are not economically feasible. Low strength is a severe limitation on sites for local roads. Special design and proper construction techniques help to overcome this limitation. Alternative sites should be selected for septic tank absorption fields and subsurface waste-water disposal systems.

The capability subclass is Vw, and the woodland ordination symbol is 10W.

95—Pits-Udorthents complex. This map unit consists of gravel pits, sand pits, borrow pits, piles of spoil, and heaps of soil material mixed with gravel. It occurs throughout the county.

The pits are open excavations from which gravel and sand have been removed. The depth to sand and gravel ranges from 0 to more than 50 feet. The material removed from the pits has been excavated for use in roads, driveways, and parking areas. Some pits are fairly high in content of clay; locally, the material is called clay gravel. The strata containing the gravel are many feet thick in places. In some areas clay has been excavated for special uses, such as making bricks and other building materials. In a few areas silty material has been excavated for use as fill material in highway construction.

Udorthents are piles of spoil material of varying depth and composition. The material is a mixture of overburden and the underlying geologic deposits. The texture varies from clay to gravel. In the western part of the county, the soil material is mainly loess. In the central and eastern parts, it has a high content of sand and gravel.

Some abandoned pits are reverting to woodland. A few places support good stands of pine trees. In the open pits, the soil material supports a sparse growth of native grasses and weeds and clumps of spindly pines and low-quality hardwoods. Most of this vegetation is useful only for erosion control and as habitat for wildlife. Many areas of this unit are bare of vegetation.

This unit is poorly suited to crops, pasture, and woodland. Limitations affecting most urban uses are moderate or severe. Some areas are suited to recreational uses, such as the operation of offroad recreational vehicles.

No capability subclass or woodland ordination symbol is assigned.

Prime Farmland

In this section, prime farmland is defined and the soils in Franklin County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent.

About 96,960 acres, or 27 percent of Franklin County, meets the soil requirements for prime farmland. Areas are scattered throughout the county, but most areas are in general soil map units 1 and 6. Approximately 23,000 acres of this prime farmland is used for crops. Crops grown on this land, mainly corn, soybeans, wheat, hay, and sorghum, account for much of the county's total agricultural income each year.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and difficult to cultivate and are generally less productive.

The map units in Franklin County that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

Some soils that have a high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. If applicable, the need for these measures is indicated in parentheses after the map unit name in table 5. Onsite evaluation is necessary to determine if the limitations have been overcome by corrective measures.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

James S. Parkman, conservationist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

In 1987, more than 41,951 acres in Franklin County was used for crops and pasture *(26)*. Of this total, 23,554 acres was permanent pasture and 18,397 acres was used for row crops, mainly corn, soybeans, sorghum, wheat, and hay.

The primary purpose of cultivating is to reduce or eliminate competition from undesirable plants. Cultivation of the soil also causes leaching of plant nutrients and increases the hazard of erosion. Therefore, suitable cropping systems are needed to maintain the content of organic matter, to reduce the hazard of erosion, and to increase the level of fertility.

Maintaining a cover of close-growing or sod crops, planting annual cover crops, growing legumes in sequence with row crops, and using a crop rotation that includes high-residue crops help to maintain the content of organic matter, reduce the hazard of erosion, and improve fertility. The number of years that a row crop is grown depends on the type of soil, the slope, and the degree of erosion hazard. Crop residue should be left on the surface after harvest, or it should be disked into the surface layer if the soils are subject to flooding.

Applications of fertilizer are needed on all cropland in the county. Lime also is needed on most of the soils. The need for fertilizer and lime varies with the soils and the type of crop. Soil tests should be used to determine the correct amount and type of fertilizer. The local office of the Cooperative Extension Service can provide information about the proper kinds and amounts of lime and fertilizer to apply.

Some of the soils in the county have inadequate surface drainage and internal drainage. Drainage tile or

surface field ditches may be needed on these soils. Diversions are needed to protect bottom land from excessive runoff from the higher adjacent soils. Contour farming helps to control erosion and conserves moisture in gently sloping areas.

A well managed pasture consists of a good vegetative cover and vigorous root systems. Good pasture management helps to control erosion, provides feed and forage for livestock, and increases the content of organic matter in the soil.

The soils in Franklin County are suited to a wide variety of grasses and legumes for hay and pasture. Some soils are better suited than others. The type of livestock enterprise and the individual needs of the farmer should also be considered.

Perennial grasses that are well adapted to the soils in the county include common bermudagrass, dallisgrass, improved bermudagrass, bahiagrass, and tall fescue. Legumes that are well adapted include white clover, crimson clover, arrowleaf clover, and annual lespedeza.

Applications of fertilizer and lime are beneficial to all pastures. The amount and type of fertilizer and the frequency of application should be based on the results of soil tests. Proper stocking rates, rotation grazing, and other management practices improve the growth of grasses and legumes and result in better forage production.

Erosion is the major concern on much of the cropland and pasture in the county. It is a hazard in areas where slopes are more than 2 percent.

Loss of the surface layer by erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging in soils that have a layer in or below the subsoil, such as a fragipan, that limits the depth of the root zone. Providence and Loring soils are examples of soils that have a fragipan. Second, erosion on farmland results in the pollution of streams by sediment. Control of erosion minimizes this pollution and improves the quality of water for municipal and recreational uses and for fish and wildlife.

Soil drainage is the major management need on some of the acreage used for crops and pasture in the county. Unless artificial drainage is provided, the poorly drained and somewhat poorly drained soils on flood plains are so wet that crops are damaged in some years. For example, a drainage system is needed in areas of Gillsburg and Trebloc soils.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are

designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. There are no class VIII soils in Franklin County.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

J. Alan Holditch, forester, Soil Conservation Service, helped prepare this section.

Soils vary in their ability to produce trees. Available water capacity and depth of the root zone have major effects on tree growth. Fertility and texture also influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site.

About 308,210 acres in Franklin County, or 85 percent of the total acreage, is commercial forest land. It includes four major forest types *(9)*. These forest types and their approximate extent are—loblolly-shortleaf pine, 51 percent; oak-pine, 24 percent; oak-hickory, 20 percent; and oak-gum-cypress, 5 percent. Farmers and other nonindustrial, private owners control about 47 percent of the woodland, and forest industry controls 20 percent. About 33 percent is public land.

Good forest management maintains or enhances soil productivity and water quality. Unless properly applied, such forest management activities as site preparation and harvesting can adversely affect soil productivity and water quality and can cause erosion, depletion of nutrients, and surface compaction. Site-specific forest management plans that include consideration of topography, erosion hazard, time of year, and natural site fertility can prevent damage to soil and water resources.

Livestock is allowed to graze in much of the woodland in the county. The grasses, legumes, and forbs and many of the woody plants in the understory of woodland stands can be utilized for forage. Using proper stocking rates for the amount of forage produced prevents damage to desirable tree species. Additional information about the production of forage in woodland is in the section "Woodland Understory Vegetation."

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. Table 8 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 8 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter,

indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of steepness of slope. The letter *X* indicates that a soil has restrictions because of stones or rocks on the surface. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *T* indicates a soil that has, within the root zone, excessive alkalinity or acidity, sodium salts, or other toxic substances that limit the development of desirable trees. The letter *D* indicates a soil that has a limitation because of a restricted rooting depth, such as a shallow soil that is underlain by hard bedrock, a hardpan, or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *F* indicates a soil that has a large amount of coarse fragments. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use for 2 to 6 months per year, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, and rooting depth. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity* of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

The *site index* is determined by taking height

measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The estimates of the productivity of the soils in this survey are based on published data *(6)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year calculated at the age of culmination of mean annual increment.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

Woodland Understory Vegetation

David W. Sanders, assistant state resource conservationist, Soil Conservation Service, helped prepare this section.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some woodland can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

Significant changes in kind and abundance of understory plants occur as the canopy changes, often regardless of grazing use. Forage value ratings are based on the percentage of the existing understory plant community made up of preferred and desirable plant species as they relate to livestock palatability.

Table 9 shows, for each soil suitable for woodland, the potential for producing understory vegetation. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants to a height of 4.5 feet. It is expressed in pounds per acre of air-dry vegetation in a normal year.

Table 9 also lists the common names of the characteristic vegetation on each soil and the *composition*, by percentage of air-dry weight, of each kind of plant. The table shows the kind and percentage of understory plants expected under a canopy density that is most nearly typical of woodland in which the production of wood crops is highest.

Environmental Plantings

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 10 shows the height that locally grown trees are expected to reach in 20 years on various soils and the suitability of the soils for trees used in environmental plantings. The estimates are based on measurements and observation of established plantings that have been given adequate care. Table 11 shows the suitability of the soils for ornamental shrubs used in environmental plantings. The information in these tables can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and on planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

Ernest E. Dorrill III, landscape architect, Soil Conservation Service, helped prepare this section.

Because of its favorable climate and location, Franklin County has good potential for the development of many types of year-round outdoor recreational facilities. Clear Springs Lake, in the Homochitto National Forest, is operated by the Forest Service as an outdoor recreation area (fig. 14). It has facilities for boating, picnicking, and overnight camping. The Homochitto National Forest has several thousand acres of forest land with designated areas for hunting, hiking, and camping.

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

Figure 14.—A pavilion at Clear Springs Lake in the Homochitto National Forest.

In table 12, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 15 and interpretations for dwellings without basements and for local roads and streets in table 14.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive

foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

David R. Thomas, wildlife biologist, Soil Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

Wildlife is a very important resource in Franklin County. Of all the factors that affect wildlife populations, land use is the most important. Some land uses have resulted in the elimination of plant associations needed for good wildlife habitat. For this reason the kinds and numbers of wild animals in Franklin County have varied since the county was settled.

There are a number of endangered and threatened species in Franklin County. These range from the rarely seen red-cockaded woodpecker to the more commonly seen alligator and a few bald eagles. A detailed list of these species and information on habitat needs are available in the district office of the Soil Conservation Service.

The primary wildlife species in the county include white-tailed deer, squirrels, rabbits, turkeys, bobwhite quail, and waterfowl. Nongame species include raccoon, armadillo, opossum, skunk, bobcat, gray fox, red fox, otter, and a variety of songbirds, wading birds, woodpeckers, predatory birds, reptiles, and amphibians.

The Homochitto River and its tributaries support a wide variety of adapted fish. The game and nongame species include largemouth bass, smallmouth bass, redeye bass, channel catfish, bullhead catfish, bluegill, redear, warmouth, black crappie, chain pickerel, gar, bowfin, and sucker.

In table 13, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, grain sorghum, wheat, oats, millet, sunflowers, and ryegrass.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are annual lespedeza, bush lespedeza, fescue, vetch, clover, and bahiagrass.

Wild herbaceous plants are native or naturally

established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wooly croton, blackberry, greenbrier, and switchcane.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, mulberry, and persimmon. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, and slope. Examples of wetland plants are smartweed, wild millet, wildrice, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, texture, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, mourning dove, meadowlark, field sparrow, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and white-tailed deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, marsh birds, muskrat, otter, mink, and beaver.

Engineering

William W. Kiddy, civil engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground

cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

Building Site Development

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 15 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 15 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site

features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel are less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 15 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, flooding, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Steep slopes can cause construction problems.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 15 are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, slope, and flooding affect both types of landfill. Texture, stones, highly organic layers, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index

properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by a high water table and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential and slopes of 15 to 25 percent. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft shale and siltstone are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, and rock fragments.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low

seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The performance of a system is affected by the depth of the root zone and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 18 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*. Both systems are described in the "PCA Soil Primer" *(18)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in

the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 19 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil

to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 19, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 20 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 20 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 20 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 20.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is

allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

D.E. Pettry, professor of soil science, Mississippi State University, prepared this section.

The results of physical and chemical analyses of several typical pedons in the survey area are given in table 21. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Soil Genesis and Morphology Laboratory, Mississippi Agricultural and Forestry Experiment Station.

The physical properties of soils, such as infiltration rate and conduction, shrink-swell potential, crusting, consistence, and available water capacity, are closely related to soil texture.

The deep, sloping to steep, loamy soils in the uplands, such as Smithdale and Saffell soils, are high in content of sand and gravel. The coarse texture of the surface layer results in rapid water infiltration, and the soils tend to be droughty. Soils that have a high content of silt in the surface layer, such as Ariel, Bude, Collins, Gillsburg, Kolin, Loring, Memphis, Oaklimeter, and Providence soils, tend to pack when cultivated and form a crust, which may adversely affect plant emergence. Lorman soils formed in clayey marine sediments. These soils have a high content of expansive montmorillonitic clay, which tends to shrink when dry and swell when wet.

The chemical properties of soils, in combination with such soil features as permeability, structure, and texture, influence the limitations and potential of individual soils. Laboratory analyses are necessary to determine the chemical properties of a soil. The amount and type of clay minerals and the organic matter content regulate to a large extent the chemical nature of soils. These substances have the capacity to attract and hold cations. Exchangeable cations are positively charged elements that are bonded to negatively charged clay minerals and organic matter.

The exchangeable cations may be removed or exchanged through leaching or plant uptake. Through the process of cation exchange, soil acidity is corrected by applications of lime. One milliequivalent per 100 grams of extractable acidity (hydrogen plus aluminum) requires 1,000 pounds of calcium carbonate (lime) per acre to neutralize it.

Soil chemical data are expressed as milliequivalents per 100 grams of dry soil. Milliequivalents per 100 grams can be converted to pounds per acre. An acre of the plow layer, or topsoil, of average soils to a depth of 6.67 inches weighs about 2 million pounds. The conversions for the cations listed in table 21 are as follows: pounds per acre of calcium equals meq/100 grams multiplied by 400; pounds per acre of magnesium equals meq/100 grams multiplied by 240; pounds per acre of potassium equals meq/100 grams multiplied by 780; and pounds per acre of sodium equals meq/100 grams multiplied by 460.

The soils of Franklin County differ drastically in their ability to retain plant nutrients (cations). Clayey soils, such as Lorman soils, have a high cation-exchange capacity and contain high levels of calcium and magnesium. Many of the soils are acid and have a moderate to low capacity to retain plant nutrients because of the influence of siliceous parent materials. Crops on these soils respond to proper fertilization and management. Conditions are suitable for the growth of most plants when the cation-exchange capacity of a soil is about 60 percent satisfied by calcium, 15 to 20 percent by magnesium, 5 percent by potassium, and not more than 20 percent by such cations as sodium,

hydrogen, and aluminum. The pH level should be between 6 and 7 if the proper exchangeable cation composition is maintained.

Some categories of the classification system used by the National Cooperative Soil Survey use chemical soil properties as differentiating criteria *(22)*. Alfisols and Ultisols are separated on the basis of percentage base saturation deep in the subsoil. Ultisols have base saturation of less than 35 percent in the lower part of the soil. Alfisols have base saturation of more than 35 percent. For example, Smithdale soils, which are classified as Ultisols, have base saturation of less than 35 percent at a depth of more than 4 feet.

Determinations in table 21 were made on soil material smaller than 2 millimeters in diameter. The samples were prepared for analysis by air-drying, crushing, and screening through a standard 10-mesh sieve. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The particle-size analysis shown in table 21 was obtained using Day's hydrometer method *(8)*. The methods used in obtaining the other data are indicated in the list that follows. The codes in parentheses refer to published methods *(23)*.

Organic carbon—dry combustion (6A2d).

Extractable cations—ammonium acetate pH 7.0, atomic absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2b), potassium (6Q2b).

Extractable acidity—barium chloride-triethanolamine IV (6H5a).

Cation-exchange capacity—sum of cations (5A3a).

Base saturation—sum of cations, TEA, pH 8.2 (5C3).

Reaction (pH)—1:1 water dilution (8C1f).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(22)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 22 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Aeric Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-silty, mixed, acid, thermic Aeric Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(24)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(22)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Ariel Series

The Ariel series consists of well drained soils that formed in silty alluvium. These soils are on broad flood plains. Slopes are 0 to 1 percent. The soils are coarse-silty, mixed, thermic Fluventic Dystrochrepts.

Ariel soils are associated with Bruno, Collins, Oaklimeter, and Ochlockonee soils on flood plains. Bruno soils are on natural levees. They are stratified and are sandy textured. Collins and Oaklimeter soils are in the slightly lower landscape positions. They have gray mottles within a depth of 20 inches. Also, Collins soils have a stratified C horizon. Ochlockonee soils are in landscape positions similar to those of the Ariel soils. They are coarse-loamy and have a stratified C horizon.

Typical pedon of Ariel silt loam, occasionally flooded; 1.5 miles west of the Lincoln-Franklin County line along U.S. Highway 98; south 0.8 mile on a gravel road to Pumpkin Patch Creek; 150 feet west of Pumpkin Patch Creek, in a field; SE¼NW¼ sec. 36, T. 5 N., R. 5 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Bw1—6 to 18 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; silt and oxide coatings on faces of peds; few brown concretions; strongly acid; clear smooth boundary.

Bw2—18 to 27 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint light yellowish brown mottles; weak medium subangular blocky structure; friable; few fine roots; silt or oxide coatings on faces of peds; strongly acid; clear smooth boundary.

Eb—27 to 36 inches; mottled pale brown (10YR 6/3), yellowish brown (10YR 5/4), and light brownish gray (10YR 6/2) silt loam; friable; weak medium subangular blocky structure; common fine pores; few black and brown concretions; strongly acid; clear smooth boundary.

Bwxcb—36 to 62 inches; mottled light brownish gray (10YR 6/2) and light yellowish brown (10YR 6/4) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; slightly brittle and compact in 25 percent of the volume; few tongues of gray silt between prisms; common fine black and brown concretions; strongly acid.

The thickness of the solum is more than 60 inches. Depth to the buried solum ranges from 20 to 40 inches. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. In some pedons it has mottles in shades of brown or yellow. In the 10- to 40-inch control section, the content of clay ranges from 12 to 18 percent and the content of sand ranges from 3 to 15 percent.

The Eb horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 2 or 3, or it has no dominant matrix color and is mottled in shades of gray and brown. Colors with chroma of 2 or less are below a depth of 24 inches. Some pedons have a B/E or an E/B horizon in the upper part of the buried solum.

The Bwxcb horizon has no dominant matrix color and is mottled in shades of brown or gray, or it has a matrix in shades of brown and has few to many grayish mottles. It is brittle in 20 to 40 percent of the volume. It is silt loam or loam. In most pedons it has few to many black or brown concretions.

Bruno Series

The Bruno series consists of excessively drained soils that formed in stratified sandy and loamy alluvium. These soils are on natural levees on flood plains. Slopes range from 0 to 3 percent. The soils are sandy, mixed, thermic Typic Udifluvents.

Bruno soils are associated with Ariel, Collins, Oaklimeter, and Ochlockonee soils on flood plains. These associated soils are in the lower positions on the landscape. Ariel, Collins, and Oaklimeter soils are coarse-silty. Ariel and Ochlockonee soils are well drained, and Collins and Oaklimeter soils are moderately well drained. Ochlockonee soils are coarse-loamy.

Typical pedon of Bruno sandy loam, occasionally flooded; in an area along the natural levee of the Homochitto River; 1.5 miles west of Eddiceton, Mississippi, along U.S. Highway 84; 3,500 feet southeast of the highway; 1,400 feet southwest of the junction of McGehee Creek and the Homochitto River; SW¼SW¼ sec. 15, T. 6 N., R. 4 E.

Ap—0 to 7 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

C1—7 to 18 inches; light olive brown (2.5Y 5/4) loamy fine sand; single grained; loose; common bedding planes of pale brown (10YR 6/3) silt loam; common fine roots; slightly acid; clear smooth boundary.

C2—18 to 25 inches; pale brown (10YR 6/3) loamy fine sand; single grained; loose; common bedding planes of yellowish brown (10YR 5/4) sandy loam; few fine roots; medium acid; clear smooth boundary.

C3—25 to 31 inches; light olive brown (2.5Y 5/4) loamy sand; single grained; loose; medium acid; clear smooth boundary.

C4—31 to 36 inches; pale brown (10YR 6/3) sand; single grained; loose; slightly acid; clear smooth boundary.

C5—36 to 40 inches; light olive brown (2.5Y 5/4) loamy

sand; single grained; loose; slightly acid; clear smooth boundary.

C6—40 to 60 inches; pale brown (10YR 6/3) sand; single grained; loose; slightly acid.

Reaction ranges from medium acid to neutral throughout the profile.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is dominantly sand or loamy sand, but it contains thin strata of loamy very fine sand or finer textures. In some pedons it has brownish or grayish mottles in the lower part.

Bude Series

The Bude series consists of somewhat poorly drained soils on broad uplands and old stream terraces. These soils formed in a mantle of loess less than 4 feet thick and in the underlying loamy material. They have a fragipan. Slopes range from 0 to 2 percent. The soils are fine-silty, mixed, thermic Glossaquic Fragiudalfs.

Bude soils are associated with Gillsburg, Providence, and Trebloc soils. Gillsburg and Trebloc soils do not have a fragipan. Gillsburg soils are on flood plains. They are coarse-silty. Providence soils are in the slightly higher, more sloping positions on the landscape and are moderately well drained. They do not have gray mottles within a depth of 16 inches. Trebloc soils are poorly drained and are in the lower depressional areas.

Typical pedon of Bude silt loam, 0 to 2 percent slopes; in a pasture, 0.7 mile west of the Lincoln-Franklin County line along U.S. Highway 84; 0.4 mile north of the highway and 0.2 mile south of an electrical substation, in a field; SW¼NE¼ sec. 6, T. 6 N., R. 6 E.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

Bw1—5 to 11 inches; mottled yellowish brown (10YR 5/8), light brownish gray (10YR 6/2), and light yellowish brown (10YR 6/4) silt loam; weak fine and medium subangular blocky structure; friable; many fine pores; strongly acid; clear smooth boundary.

Bw2—11 to 19 inches; light yellowish brown (10YR 6/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; many fine pores; few fine black and brown concretions; very strongly acid; clear wavy boundary.

E/B—19 to 24 inches; mottled pale brown (10YR 6/3) (E), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) (Btx) silt loam; about 15 percent light brownish gray (10YR 6/2) silt coatings on primary faces of peds; weak fine and medium subangular blocky structure; slightly compact and brittle in the Btx part; common distinct clay films on faces of peds; few black and brown concretions; strongly acid; clear smooth boundary.

Btx1—24 to 43 inches; mottled strong brown (7.5YR 5/8), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/8) silt loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, compact, and brittle in more than 60 percent of the mass; few faint clay films on faces of prisms; common vertical tongues of gray silt less than 1 inch wide between peds; few pockets of light brownish gray (10YR 6/2) silty clay loam; common black and brown concretions; very strongly acid; clear wavy boundary.

2Btx2—43 to 63 inches; mottled strong brown (7.5YR 5/6), light brownish gray (10YR 6/2), and light gray (10YR 7/1) loam; moderately weak very coarse prismatic structure parting to medium subangular blocky; firm, compact, and brittle; few faint clay films on faces of prisms; common vertical tongues of silt between peds; very strongly acid.

The thickness of the solum is more than 60 inches. Depth to the fragipan ranges from 18 to 40 inches. Reaction ranges from very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4, and chroma of 2 to 4 or value of 5 or 6 and chroma of 4 to 6, or it has no dominant matrix color and is mottled in shades of brown. Some pedons in undisturbed areas have a thin A horizon, which has hue of 10YR, value of 3, and chroma of 1 or 2.

Some pedons have an E horizon. This horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8, or it has no dominant matrix color and is mottled in shades of yellow, brown, and gray. Mottles with chroma of 2 or less are within the upper 10 inches. The texture is silt loam or silty clay loam. Between a depth of 10 inches and the upper boundary of the fragipan, the content of clay ranges from 18 to 30 percent and the content of sand is less than 15 percent.

The E/B horizon is mottled in shades of brown and gray. Some pedons have a grayish E horizon or a mottled B/E horizon. The content of clay in the E/B horizon is less than that in the Bw and Btx horizons.

The Btx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2 and has mottles in shades of

brown and yellow, or it has no dominant matrix color and is mottled in shades of yellow, brown, and gray. It is silt loam or silty clay loam.

Below the Bw horizon and within a depth of 48 inches, the content of sand is more than 15 percent. The 2Btx horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2 and has common or many mottles in shades of gray, yellow, and brown, or it is mottled in these colors and has no dominant matrix color. It is loam, silty clay loam, or clay loam.

Cahaba Series

The Cahaba series consists of well drained soils that formed in loamy and sandy alluvium. These soils are on stream terraces. Slopes range from 0 to 3 percent. The soils are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils are associated with Memphis and Providence soils. These associated soils are in the higher positions on slopes in the adjacent uplands. They are fine-silty. The moderately well drained Providence soils have a fragipan.

Typical pedon of Cahaba sandy loam, 0 to 3 percent slopes; about 1.5 miles southeast of the Meadville city limits, along a blacktop road, then southwest 0.75 mile on a private road; 200 feet east of the road, in a field; 0.5 mile north and 0.2 mile west of the southeast corner of sec. 42, T. 6 N., R. 3 E.

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; friable; few roots; strongly acid; abrupt smooth boundary.

Bt1—8 to 21 inches; yellowish red (5YR 5/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; few roots; common distinct clay films on faces of peds; few fine pores; strongly acid; gradual smooth boundary.

Bt2—21 to 32 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; clay bridges between sand grains; strongly acid; gradual smooth boundary.

Bt3—32 to 43 inches; yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; friable; few distinct clay films on faces of peds; clay bridges between sand grains; few small pockets of light gray sand; strongly acid; gradual smooth boundary.

BC—43 to 55 inches; strong brown (7.5YR 4/6) sandy loam; weak coarse subangular blocky structure; very friable; strongly acid; diffuse smooth boundary.

C—55 to 62 inches; strong brown (7.5YR 4/6) sandy loam; massive; very friable; strongly acid.

The thickness of the solum ranges from 36 to 60 inches. Reaction ranges from very strongly acid to medium acid, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4.

The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 6 to 8. It is sandy clay loam, loam, or clay loam. In the upper 20 inches of the Bt horizon, the content of clay is 18 to 35 percent and the content of silt is 20 to 50 percent.

The C horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 6 to 8 or has hue of 10YR, value of 5, and chroma of 4 to 8. It commonly is sandy loam or fine sandy loam, but in some pedons it has strata of sand or loamy sand. In some pedons it has few to many mottles in shades of yellow, brown, and gray.

Collins Series

The Collins series consists of moderately well drained soils that formed in silty alluvium. These soils are on flood plains. Slopes are 0 to 1 percent. The soils are coarse-silty, mixed, acid, thermic Aquic Udifluvents.

Collins soils are associated with Ariel, Bruno, Gillsburg, Oaklimeter, and Ochlockonee soils on flood plains. Ariel soils are well drained and are in the higher positions on the landscape. Bruno soils are in the higher positions on natural levees and are excessively drained. They are sandy textured. Gillsburg soils are in the slightly lower positions along drainageways and are somewhat poorly drained. They have a gray matrix within a depth of 20 inches. Oaklimeter soils are in landscape positions similar to those of the Collins soils. They do not have bedding planes in the upper 10 to 20 inches. Ochlockonee soils are well drained and are mainly nearer channels than the Collins soils. They are coarse-loamy.

Typical pedon of Collins silt loam, occasionally flooded; about 3.0 miles south of Garden City on State Highway 33, then east 0.5 mile on a gravel road and south 0.25 mile on woods road, in a wooded area; 0.4 mile north and 0.3 mile west of the southeast corner of sec. 12, T. 4 N., R. 1 E.

A—0 to 6 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

C1—6 to 16 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; common fine roots; evident bedding planes; strongly acid; clear smooth boundary.

C2—16 to 25 inches; yellowish brown (10YR 5/4) silt loam; few medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; massive; friable; few fine roots; evident bedding

planes; strongly acid; clear smooth boundary.

C3—25 to 38 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) silt loam; massive; common fine brown and black concretions; friable; evident bedding planes; strongly acid; clear smooth boundary.

Cg—38 to 47 inches; light brownish gray (10YR 6/2) silt loam; many fine faint yellowish brown and pale brown mottles; massive; friable; few fine brown concretions; evident bedding planes; strongly acid; clear smooth boundary.

C′—47 to 60 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and pale brown (10YR 6/3) silt loam; massive; friable; evident bedding planes; few thin strata of very fine sandy loam and loam; strongly acid.

Reaction is very strongly acid or strongly acid throughout the profile. The content of clay in the 10- to 40-inch particle-size control section ranges from 5 to 18 percent. The content of sand is as much as 30 percent, but less than 15 percent is coarser than very fine sand.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4.

The upper part of the C horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4. It is silt or silt loam. Few to many mottles with chroma of 2 or less are within a depth of 20 inches. The mottles commonly begin at a depth of about 16 inches and increase in abundance with increasing depth.

The lower part of the C horizon is mottled in shades of brown and gray and has no dominant matrix color, or it has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 or less and has mottles in shades of brown or gray. It is silt loam and has few or common discontinuous strata of very fine sandy loam, loam, or silt.

Gillsburg Series

The Gillsburg series consists of nearly level, somewhat poorly drained soils that formed in silty alluvium. These soils are on broad flood plains and in drainageways. Slopes range from 0 to 2 percent. The soils are coarse-silty, mixed, acid, thermic Aeric Fluvaquents.

Gillsburg soils are associated with Bude, Collins, Oaklimeter, and Trebloc soils. Bude soils are on uplands and old stream terraces. They have a fragipan. Collins and Oaklimeter soils are in the higher positions on the flood plains and are moderately well drained. They are browner in the upper 20 inches than the Gillsburg soils. Trebloc soils are on low stream terraces and are poorly drained. They have a gray matrix below the surface layer.

Typical pedon of Gillsburg silt loam, occasionally flooded; about 1.0 mile west of Mississippi Highway 33 at Garden City, along a blacktop road; 1.25 miles southwest on a field road; 600 feet east of the road, in a field; 0.5 mile south and 0.2 mile east of the northwest corner of sec. 44, T. 5 N., R. 1 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint pale brown mottles; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

Bw—6 to 16 inches; mottled brown (10YR 5/3), light brownish gray (10YR 6/2), and dark brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; common fine roots; few coatings of silt and oxides on faces of peds; few fine and medium black and brown concretions; strongly acid; gradual smooth boundary.

Bgc—16 to 34 inches; light brownish gray (10YR 6/2) silt loam; common medium faint brown (10YR 5/3) and common medium distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few roots; few coatings of silt and oxides on faces of peds; common fine and medium black and brown concretions and stains; strongly acid; clear irregular boundary.

Eb—34 to 41 inches; light brownish gray (10R 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; friable; few fine and medium black and brown concretions; strongly acid; clear irregular boundary.

E/B—41 to 64 inches; light brownish gray (10YR 6/2) (Ex) silt loam; many medium distinct yellowish brown (10YR 5/6) and dark grayish brown (10YR 4/2) mottles (Btxb); weak very coarse prismatic structure parting to weak medium subangular blocky; firm, slightly brittle, and compact in about 35 percent of the volume; few faint clay films on faces of peds; gray tongues of silt loam 0.5 inch to 2.0 inches wide between faces of prisms; gray tongues making up about 15 percent of the mass; few fine and medium black and brown concretions; strongly acid.

Depth to the buried soil, if it occurs, commonly ranges from 20 to 50 inches. In some pedons the buried soil is below a depth of 50 inches. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3, or it has hue of 2.5Y, value of 4 or 5, and chroma of 2.

The Bw horizon has hue of 10YR, value of 4 or 5,

and chroma of 3 or 4 and has grayish mottles, or it has no dominant matrix color and is mottled in shades of brown and gray. In some pedons it has few or common brown and black concretions. It is silt, silt loam, or very fine sandy loam. The 10- to 40-inch particle-size control section has 10 to 18 percent clay, 60 to 80 percent silt, and 10 to 18 percent sand.

The Bg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and has mottles in shades of brown, or it has no dominant matrix color and is mottled in shades of gray and brown. It is silt loam, silt, or very fine sandy loam. It has few to many brown and black concretions.

The buried horizons have hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and have common or many medium or coarse mottles in shades of brown. These horizons are slightly brittle or compact in less than 40 percent of the volume and have weak to strong, coarse or very coarse prismatic structure with tongues of gray silt loam separating the faces of the prisms. The texture is silt loam, loam, or silty clay loam. In most pedons these horizons have few to many fine to coarse, black and brown concretions.

Kolin Series

The Kolin series consists of moderately well drained soils that formed in loess about 2.5 feet thick and in the underlying clayey marine sediments. These soils are on ridgetops in the uplands. Slopes range from 2 to 8 percent. The soils are fine-silty, siliceous, thermic Glossaquic Paleudalfs.

Kolin soils are associated on the landscape with Lorman, Providence, and Smithdale soils. Lorman soils are in the lower positions on hillsides. They are fine textured. Providence soils are in landscape positions similar to those of the Kolin soils. They have a fragipan. Smithdale soils are on hillsides and are well drained. They are fine-loamy.

Typical pedon of Kolin silt loam, 2 to 8 percent slopes, eroded; about 6.8 miles east of Knoxville on Forest Service Road 102, 0.5 mile south on Forest Service Road 188, 200 feet east of the intersection of the pipeline and Forest Service Road 188, in a wooded area; SW¼NE¼ sec. 17, T. 5 N., R. 2 E.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

Bt1—5 to 15 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

Bt2—15 to 23 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; common distinct clay films on faces of peds; pale brown (10YR 6/3) silt coatings on faces of some peds in the lower part; strongly acid; gradual wavy boundary.

B/E—23 to 29 inches; yellowish brown (10YR 5/6) silt loam (Bt); 15 percent pale brown (10YR 6/3) silt coatings (E) surrounding peds; common fine faint strong brown mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; few faint clay films on faces of peds; strongly acid; abrupt smooth boundary.

2Bt1—29 to 42 inches; red (2.5YR 4/6) clay; many coarse prominent strong brown (7.5YR 5/6) and grayish brown (2.5Y 5/2) mottles; moderate fine and medium angular blocky structure; firm, sticky, plastic; common distinct clay films on faces of peds; slightly acid; gradual wavy boundary.

2Bt2—42 to 62 inches; yellowish brown (10YR 5/6) silty clay; many coarse prominent dark grayish brown (2.5YR 4/2) and gray (10YR 6/1) mottles; moderate fine and medium subangular blocky structure; firm, sticky, plastic; common distinct clay films on faces of peds; slightly acid.

The thickness of the solum ranges from 60 to 100 inches. Depth to the 2Bt horizon ranges from 20 to 40 inches. Reaction ranges from very strongly acid to medium acid in the upper part of the solum, except in areas where the surface layer has been limed. It ranges from very strongly acid to slightly acid in the lower part of the solum.

The A or Ap horizon has value of 3 or 4 and chroma of 1 to 3.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 2 or 3.

The Bt horizon and the Bt part of the B/E horizon have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. They are silty clay loam or silt loam. The content of clay ranges from 20 to 35 percent in the particle-size control section of the upper 20 inches.

The 2Bt horizon is mottled in shades of red, brown, and gray, or it has a matrix with hue of 2.5YR to 10YR, value of 4 or 5, and chroma of 6 to 8 and has mottles in shades of gray. It is clay or silty clay.

Lexington Series

The Lexington series consists of well drained soils that formed in a mantle of loess about 2 to 3 feet thick and in the underlying loamy marine sediments. These soils are on ridgetops in dissected uplands. Slopes range from 5 to 20 percent. The soils are fine-silty, mixed, thermic Typic Paleudalfs.

Lexington soils are geographically associated with

Memphis, Providence, and Smithdale soils in the uplands. Memphis soils are in landscape positions similar to those of the Lexington soils. They have less than 5 percent sand to a depth of more than 48 inches. Providence soils are on ridgetops and are moderately well drained. They have a fragipan. Smithdale soils are on side slopes. They are fine-loamy.

Typical pedon of Lexington silt loam, in an area of Smithdale-Lexington-Memphis association, 5 to 40 percent slopes; in a wooded area about 0.25 mile east of the Adams-Franklin County line along U.S. Highway 84; 2.0 miles south along a gravel road, then 800 feet west of the road, on a ridgetop; 0.3 mile north and 0.1 mile west of the southeast corner of sec. 9, T. 6 N., R. 1 E.

A—0 to 5 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

E—5 to 12 inches; light yellowish brown (10YR 6/4) silt loam; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

Bt1—12 to 36 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

2Bt2—36 to 48 inches; strong brown (7.5YR 5/8) sandy loam; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds and on sand grains; few pockets of pale brown sand; strongly acid; gradual wavy boundary.

2Bt3—48 to 62 inches; red (2.5YR 5/6) sandy loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds and on sand grains; few pockets of pale brown sand; strongly acid.

The thickness of the solum is more than 60 inches. The combined thickness of the A and B horizons containing less than 15 percent sand coarser than very fine sand is less than 48 inches. Reaction ranges from very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 6.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 to 6.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. It is silt loam or silty clay loam. The particle-size control section, or the upper 20 inches of the Bt horizon, contains 18 to 35 percent clay and has 5 to 10 percent fine sand and coarser sand. The content of sand increases with increasing depth.

The 2Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. It is loam or sandy loam. In most pedons it has few or common thin pockets of brownish or yellowish sand or loamy sand.

Loring Series

The Loring series consists of moderately well drained soils that formed in thick deposits of loess. These soils are on undulating to hilly uplands. They have a fragipan. Slopes range from 0 to 8 percent. The soils are fine-silty, mixed, thermic Typic Fragiudalfs.

Loring soils are geographically associated with Memphis, Providence, and Smithdale soils in the uplands. The well drained Memphis soils are on higher ridgetops than the Loring soils. They do not have a fragipan. Providence soils are on the narrower ridgetops. They have more than 15 percent sand within a depth of 48 inches. Smithdale soils are on the steeper hillsides and are well drained. They are fine-loamy and do not have a fragipan.

Typical pedon of Loring silt loam, 2 to 5 percent slopes, eroded; about 1.0 mile west of State Highway 33 at Garden City, along a blacktop road; about 0.25 mile southwest along a field road; 100 feet east of the road, in a field; 0.4 mile north and 0.2 mile west of the southeast corner of sec. 42, T. 5 N., R. 1 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine and medium roots; very slightly acid; clear smooth boundary.

Bt—6 to 24 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; few distinct clay films on faces of peds; medium acid; gradual smooth boundary.

Btx1—24 to 34 inches; mottled yellowish brown (10YR 5/6), pale brown (10YR 6/3), and light gray (10YR 7/2) silt loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; brittle and compact in approximately 65 percent of the volume; common fine and medium vesicular pores; common faint clay films on faces of peds and prisms; many distinct gray silt coatings on faces of prisms; strongly acid; gradual wavy boundary.

Btx2—34 to 46 inches; yellowish brown (10YR 5/6) silt loam; common medium faint light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; slightly brittle and compact in approximately 60 percent of the volume; common distinct gray silt coatings on faces of prisms and peds; common faint clay films on faces of peds; few

medium black stains; strongly acid; gradual wavy boundary.

Btx3—46 to 61 inches; mottled strong brown (7.5YR 5/6), light yellowish brown (10YR 6/4), and light gray (10YR 7/1) silt loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; slightly brittle and compact in approximately 60 percent of the volume; common distinct gray silt coatings on faces of prisms and peds; few faint clay films on faces of peds; strongly acid.

The thickness of the solum ranges from 45 to more than 65 inches. Depth to the fragipan ranges from 20 to 34 inches. Reaction ranges from very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed. The content of sand is generally less than 5 percent throughout the solum, but it may range to 15 percent.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam. In some pedons it has gray mottles in the lower part.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6 and has mottles in shades of yellow, brown, and gray, or it is mottled in these colors and has no dominant matrix color. It is silt loam or silty clay loam. In some pedons it has few or common black and brown concretions.

Lorman Series

The Lorman series consists of moderately well drained, very slowly permeable soils that formed in interbedded silty and clayey marine sediments. These soils are on hilly and ruggedly dissected uplands. Slopes range from 8 to 35 percent. The soils are fine, montmorillonitic, thermic Vertic Hapludalfs.

Lorman soils are geographically associated with Kolin, Saffell, and Smithdale soils in the uplands. Kolin soils are on the higher ridgetops. They are fine-silty. The well drained Saffell and Smithdale soils are in landscape positions similar to those of the Lorman soils. Saffell soils are loamy-skeletal, and Smithdale soils are fine-loamy.

Typical pedon of Lorman silt loam, 15 to 35 percent slopes; about 4.25 miles east of Mississippi Highway 33 at Knoxville, Mississippi, along a blacktop road, 0.25 mile past Forest Service Road 102, 300 feet north of the blacktop road; SE¼NW¼ sec. 19, T. 5 N., R. 2 E.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

AB—2 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium granular structure; friable; many fine and few medium roots; strongly acid; clear smooth boundary.

Bt1—5 to 10 inches; yellowish red (5YR 5/6) clay; brown (7.5YR 5/4) on ped exteriors; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; common distinct clay films on faces of peds; medium acid; gradual wavy boundary.

Bt2—10 to 16 inches; yellowish red (5YR 5/6) silty clay; common medium distinct strong brown (7.5YR 5/6) and dark brown (7.5YR 4/4) and common fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; many prominent clay films and common stress surfaces on faces of peds; medium acid; gradual wavy boundary.

Btss1—16 to 27 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 5/8), pale brown (10YR 6/3), and light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; many prominent clay films and common stress surfaces on faces of peds; few slickensides; medium acid; gradual smooth boundary.

Btss2—27 to 33 inches; light brownish gray (10YR 6/2) silty clay loam; common coarse prominent yellowish red (5YR 5/6) mottles; weak medium angular blocky structure; firm; slightly sticky, slightly plastic; many prominent clay films and stress surfaces on faces of peds; few slickensides; medium acid; gradual smooth boundary.

BC—33 to 53 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct reddish yellow (5YR 6/6) and light reddish brown (5YR 6/4) mottles; weak medium angular blocky structure; firm; medium acid; gradual smooth boundary.

C—53 to 64 inches; light brownish gray (10YR 6/2), soft, thinly bedded silt with laminae of silt loam, silty clay loam, weakly indurated siltstone, and clay; common medium distinct reddish yellow (5YR 6/6) stains; massive; firm; many soft to hard siltstone fragments; slightly acid.

The thickness of the solum ranges from 40 to 60 inches. Reaction ranges from very strongly acid to slightly acid in the A horizon and in the E horizon, if it occurs. It ranges from very strongly acid to mildly alkaline in the Bt and C horizons.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. The Ap horizon, if it occurs, has hue

of 10YR, value of 4 to 6, and chroma of 2 to 6.

The E horizon, if it occurs, has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. It is silt loam, fine sandy loam, or loam.

The upper part of the Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 3 to 8. In some pedons it has few or common mottles in shades of brown or gray. It is clay, silty clay, or silty clay loam. The particle-size control section, or the upper 20 inches of the Bt horizon, has 35 to 55 percent clay.

The lower part of the Bt horizon has no dominant matrix color and is mottled in shades of red, brown, and gray, or it has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 2 to 8 and has few or common mottles in shades of brown and gray. It is clay, silty clay, or silty clay loam. In some pedons it has few to many very fine to medium fragments of siltstone.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It commonly has mottles or stains in shades of brown or red. It consists of irregularly bedded sediments of massive clayey or thinly bedded silty material with strata of weakly indurated laminae of siltstone. The texture of the C horizon is variable but commonly is clay, silty clay, silty clay loam, silt, or silt loam and has few to many fragments of siltstone. In some pedons the C horizon has few or common nodules of calcium carbonate.

Memphis Series

The Memphis series consists of well drained soils that formed in thick deposits of loess. These soils are on ridgetops and side slopes in steep, highly dissected uplands and on ridgetops in rolling uplands. Slopes range from 2 to 45 percent. The soils are fine-silty, mixed, thermic Typic Hapludalfs.

Memphis soils are geographically associated with Cahaba, Loring, Lexington, and Smithdale soils. Cahaba soils are fine-loamy. They are on the lower nearby stream terraces. The moderately well drained Loring soils are on the broader ridgetops. They have a fragipan. Lexington soils are mainly on narrow ridgetops. They contain more than 15 percent sand within a depth of 48 inches. Smithdale soils are fine-loamy. They are in the lower landscape positions on hillsides.

Typical pedon of Memphis silt loam, 5 to 8 percent slopes, eroded; 1.0 mile east of Adams County and 0.5 mile south of the Jefferson-Franklin County line, 500 feet west of Thompson Creek, 350 feet south of a farm road, in a field; NE¼NW¼ sec. 14, T. 7 N., R. 1 E.

Ap—0 to 6 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

Bt1—6 to 30 inches; dark brown (7.5YR 4/4) silty clay loam; weak to moderate fine and medium subangular blocky structure; friable, slightly sticky; common fine roots; common distinct clay films on faces of peds; few distinct discontinuous dark oxide coatings on faces of peds; strongly acid; clear smooth boundary.

Bt2—30 to 41 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; slightly sticky; few fine roots and tubular pores; few distinct clay films on faces of peds; few distinct gray silt coatings on faces of peds and in tubular pores; strongly acid; clear smooth boundary.

C—41 to 72 inches; strong brown (7.5YR 5/6) silt loam; massive; friable; few prominent light gray (10YR 7/2) silt coatings on faces of vertical joints and in pores; strongly acid.

The thickness of the solum commonly is 32 to 55 inches but ranges from 32 to 72 inches. Reaction ranges from very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed. The calcium-magnesium ratio is 1 or more.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 1 to 4. Some pedons have a thin A horizon, which has hue of 7.5YR or 10YR, value of 3, and chroma of 2 or 3.

The Bt and C horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The Bt horizon is silty clay loam or silt loam. The content of clay in the upper 20 inches of the Bt horizon typically ranges from 25 to 30 percent, but in some pedons it ranges from 20 to 35 percent. The content of sand is less than 5 percent to a depth of 48 inches or more. In some pedons the Bt horizon has few to many black coatings and stains on faces of peds. In some pedons, the Bt horizon does not have gray or pale brown silt coatings in cracks on faces of peds and in tubular pores and the C horizon does not have silt coatings in vertical joints and tubular pores.

Oaklimeter Series

The Oaklimeter series consists of moderately well drained soils that formed in silty alluvium. These soils are on broad flood plains. Slopes range from 0 to 2 percent. The soils are coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts.

Oaklimeter soils are associated with Ariel, Bruno, Collins, and Gillsburg soils on flood plains. The well drained Ariel soils are in the slightly higher positions.

They do not have mottles with chroma of 2 or less within a depth of 24 inches. The excessively drained Bruno soils are in the higher positions on the flood plains, on natural levees. They are sandy textured. Collins soils are in landscape positions similar to those of the Oaklimeter soils. They have bedding planes in the upper 10 to 20 inches. Gillsburg soils are in the slightly lower positions on the landscape. They have a gray matrix within a depth of 20 inches.

Typical pedon of Oaklimeter silt loam, occasionally flooded; 2 miles west of Meadville on U.S. Highway 84, south along a paved road for 4 miles, east along a farm road for 2 miles; 200 feet west, in a field; 0.1 mile south and 0.2 mile west of the northeast corner of sec. 23, T. 5 N., R. 3 E.

Ap—0 to 6 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Bw1—6 to 13 inches; yellowish brown (10YR 5/4) silt loam; common medium faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; common fine roots; few black and dark brown stains; strongly acid; gradual smooth boundary.

Bw2—13 to 27 inches; yellowish brown (10YR 5/4) silt loam; many fine and medium distinct light brownish gray (10YR 6/2) and faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few fine roots; few strong brown stains; strongly acid; clear smooth boundary.

E/Bb—27 to 34 inches; 80 percent light brownish gray (10YR 6/2) silt loam (E) and 20 percent yellowish brown (10YR 5/6) and pale brown (10YR 6/3) silt loam (B); weak coarse prismatic structure parting to weak medium subangular blocky; firm; few black and brown stains on faces of peds; strongly acid; gradual smooth boundary.

Btgb—34 to 62 inches; light brownish gray (10YR 6/2) silt loam; few medium distinct yellowish brown (10YR 5/4 and 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few faint clay films on faces of peds; many fine strong brown and yellowish red stains on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Depth to the buried soil ranges from 20 to 40 inches. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The Bw1 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4, or it has hue of 7.5YR, value of 4, and chroma of 4. In some pedons it has few or common mottles in shades of brown and gray. The Bw2 horizon has a matrix similar to that of the Bw1 horizon and has few to many mottles in shades of gray, or it is mottled in shades of brown and gray and has no dominant matrix color. The Bw horizon is silt loam, loam, or very fine sandy loam. The content of clay in the 10- to 40-inch particle-size control section ranges from 7 to 18 percent.

The E/Bb and Btgb horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2 and have mottles in shades of brown and gray, or they are mottled in these colors and have no dominant matrix color. They are silt loam or silty clay loam. In some pedons they have few to many black and brown stains and soft bodies.

Ochlockonee Series

The Ochlockonee series consists of well drained soils that formed in loamy alluvium. These soils are on flood plains. Slopes range from 0 to 2 percent. The soils are coarse-loamy, siliceous, acid, thermic Typic Udifluvents.

Ochlockonee soils are associated with Ariel, Bruno, and Collins soils on flood plains. Ariel soils are coarse-silty. They are in landscape positions similar to those of the Ochlockonee soils. Bruno soils are in the slightly higher positions on natural levees and are excessively drained. They are sandy textured. The moderately well drained Collins soils are in the slightly lower positions on the landscape. They are coarse-silty.

Typical pedon of Ochlockonee fine sandy loam, occasionally flooded; 2 miles west of Meadville along U.S. Highway 84; about 4 miles south along a paved road, then left at farm headquarters; 1 mile southeast on a field road, 50 feet south of the road, in a field; 0.15 mile north and 0.35 mile west of the southeast corner of sec. 13, T. 5 N., R. 3 E.

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

C1—5 to 11 inches; dark brown (10YR 4/3) fine sandy loam; massive; friable; common fine and medium roots; few thin discontinuous strata of loam; strongly acid; clear smooth boundary.

C2—11 to 15 inches; yellowish brown (10YR 5/4) sandy loam; massive; very friable; few fine and medium roots; common thin discontinuous strata of light yellowish brown loamy sand; strongly acid; clear smooth boundary.

C3—15 to 25 inches; brown (10YR 5/3) fine sandy

loam; massive; friable; few fine and medium roots; few thin strata of loam; strongly acid; clear smooth boundary.

C4—25 to 36 inches; brown (10YR 5/3) fine sandy loam; massive; friable; few fine roots; few thin discontinuous strata of dark brown, yellowish brown, and pale brown loam; strongly acid; clear smooth boundary.

C5—36 to 53 inches; brown (10YR 5/3) silt loam; few fine faint dark yellowish brown and yellowish brown mottles; massive; friable; few thin horizontal strata of pale brown sandy loam; very strongly acid; clear smooth boundary.

C6—53 to 65 inches; thin strata of dark brown (10YR 4/3) silt loam and dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; massive; friable; very strongly acid.

Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 2 to 4.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In some pedons it has few to many mottles in shades of brown, yellow, and gray below a depth of 20 inches. Strata within the C horizon range from loamy sand to silty clay loam, but the 10- to 40-inch particle-size control section is dominantly fine sandy loam or loam and has less than 18 percent clay and more than 15 percent fine sand and coarser sand. Some pedons have a buried A horizon.

Providence Series

The Providence series consists of moderately well drained soils that formed in a mantle of loess about 2 feet thick and in the underlying loamy sediments. These soils are on ridgetops in hilly, dissected uplands. They have a fragipan. Slopes range from 0 to 8 percent. The soils are fine-silty, mixed, thermic Typic Fragiudalfs.

Providence soils are geographically associated with Bude, Cahaba, Kolin, Lexington, Loring, and Smithdale soils. Cahaba, Kolin, Lexington, and Smithdale soils do not have a fragipan. The somewhat poorly drained Bude soils are in the lower positions in the uplands and on old stream terraces. They have mottles with chroma of 2 or less in the upper 16 inches. The well drained Cahaba soils are on stream terraces. They are fine-loamy. Loring soils are mainly on the wider ridgetops. They have less than 15 percent sand to a depth of 48 inches or more. Kolin soils are in positions on ridgetops similar to those of the Loring soils. They have clayey horizons within a depth of about 3 feet. The well drained Lexington soils are in positions on ridgetops similar to those of the Providence soils. Smithdale soils are in the lower positions on hillsides. They are fine-loamy.

Typical pedon of Providence silt loam, 2 to 5 percent slopes, eroded; 2 miles west of the Lincoln-Franklin County line on U.S. Highway 98; 1 mile south on a gravel road, 150 feet west of the road, in a forest; SE¼SW¼ sec. 35, T. 5 N., R. 5 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

Bt—6 to 21 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; few distinct black and dark brown stains on faces of peds; strongly acid; gradual smooth boundary.

Btx1—21 to 28 inches; yellowish brown (10YR 5/6) silt loam; common medium faint yellowish brown (10YR 5/4) and common medium distinct strong brown (7.5YR 5/6), pale brown (10YR 6/3), and light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle, and compact in about 60 to 70 percent of the volume; common fine and medium voids and pores; gray silt seams between prisms; few faint clay films on faces of peds; few black stains on faces of peds; few fine and medium black concretions; very strongly acid; gradual smooth boundary.

Btx2—28 to 44 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle, and compact in approximately 70 percent of the volume; gray seams between prisms; common fine voids and pores; few faint clay films on faces of peds; few black stains on faces of peds; very strongly acid; gradual smooth boundary.

2Btx3—44 to 64 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct yellowish brown (10YR 5/8), yellowish red (5YR 5/8), and light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle, and compact in approximately 60 percent of the volume; gray seams between prisms; common fine voids and pores; few faint clay films on faces of peds; very strongly acid.

Depth to the fragipan ranges from 18 to 38 inches.

The content of sand is more than 15 percent within a depth of 48 inches. Reaction ranges from very strongly acid to medium acid throughout the profile, except in areas where the surface layer has been limed.

The Ap horizon has hue of 10YR and value and chroma of 3 to 6. Some pedons have an A horizon, which has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. In eroded areas, the Ap horizon consists of soil material mixed from the horizons below.

The E horizon, if it occurs, has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 to 8. It is silt loam or silty clay loam. It commonly contains 20 to 30 percent clay and 5 to 15 percent sand.

The Btx and 2Btx horizons have hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 6 to 8 and have mottles in shades of gray, brown, and red, or they are mottled in shades of these colors and have no dominant matrix color. The Btx horizon is silty clay loam or silt loam. The 2Btx horizon is clay loam, sandy clay loam, loam, or sandy loam. In some pedons these horizons have few to many concretions.

Saffell Series

The Saffell series consists of well drained soils that formed in gravelly, loamy and sandy marine and fluvial sediments. These soils are on highly dissected, rugged and hilly uplands. Slopes range from 15 to 40 percent. The soils are loamy-skeletal, siliceous, thermic Typic Hapludults.

Saffell soils are geographically associated with Lorman and Smithdale soils. These soils are in positions on hillsides similar to those of the Saffell soils. Lorman soils are moderately well drained and are fine textured. Smithdale soils are fine-loamy.

Typical pedon of Saffell gravelly sandy loam, 15 to 40 percent slopes; 0.4 mile west of the Lincoln-Franklin County line along U.S. Highway 84, then 150 feet south of the roadway, in a wooded area; SW¼SE¼ sec. 6, T. 6 N., R. 6 E.

A—0 to 4 inches; brown (10YR 5/3) gravelly sandy loam; weak fine granular structure; very friable; many fine roots; about 20 percent rounded gravel, by volume; strongly acid; clear smooth boundary.

E—4 to 8 inches; yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; very friable; many fine roots; about 20 percent rounded gravel, by volume; strongly acid; gradual smooth boundary.

Bt1—8 to 20 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam; moderate fine subangular blocky structure; friable; common distinct clay films on faces of peds; few fine roots; about 40 percent rounded gravel, by volume; strongly acid; gradual wavy boundary.

Bt2—20 to 32 inches; yellowish red (5YR 5/6) very gravelly loam; weak fine subangular blocky structure; friable; sand grains coated and bridged with clay; about 55 percent rounded gravel, by volume; strongly acid; gradual wavy boundary.

Bt3—32 to 50 inches; strong brown (7.5YR 5/8) very gravelly loam; weak fine subangular blocky structure; friable; sand grains coated and bridged with clay; about 55 percent rounded gravel, by volume; common discontinuous thin strata of yellowish red loam; strongly acid; gradual wavy boundary.

C—50 to 75 inches; red (2.5YR 4/6) very gravelly sandy loam; massive; friable; about 55 percent rounded gravel, by volume; strongly acid.

The thickness of the solum ranges from 35 to 60 inches. The content of clay decreases with increasing depth in the lower part of the solum. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 6. The content of gravel ranges from 15 to 35 percent, by volume.

The E horizon, if it occurs, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 6. It is gravelly fine sandy loam or gravelly sandy loam. The content of gravel ranges from 15 to 35 percent.

The Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 to 6, and chroma of 4 to 8. It is very gravelly sandy clay loam, very gravelly loam, very gravelly clay loam, or very gravelly fine sandy loam. The content of gravel ranges from 35 to 60 percent, by volume. The particle-size control section, or the upper 20 inches of the B horizon, has 18 to 28 percent clay.

The C horizon typically has the same range in color as the Bt horizon, but in some pedons the C horizon is mottled in shades of red, brown, or yellow and has no dominant matrix color. It is gravelly loamy sand, gravelly sandy loam, very gravelly loamy sand, very gravelly sandy loam, or gravelly sandy clay loam. The content of gravel ranges from 20 to 60 percent, by volume.

Smithdale Series

The Smithdale series consists of well drained soils that formed in loamy sediments. These soils are on highly dissected, steep, hilly uplands. Slopes range from 5 to 40 percent. The soils are fine-loamy, siliceous, thermic Typic Hapludults.

Smithdale soils are geographically associated with Kolin, Lexington, Loring, Lorman, Memphis, Providence,

and Saffell soils in the hilly uplands. Kolin, Lexington, Loring, Providence, and Memphis soils are fine-silty. Kolin soils are in the higher positions on ridgetops and are moderately well drained. Lexington soils are mainly on ridgetops. Loring and Providence soils are on ridgetops and are moderately well drained. They have a fragipan. Memphis soils are on ridgetops and shoulder slopes. Lorman soils are on hillsides in landscape positions similar to those of the Smithdale soils. They are fine textured. Saffell soils are in positions on hillsides similar to those of the Smithdale soils. They are loamy-skeletal.

Typical pedon of Smithdale sandy loam, 15 to 40 percent slopes; 6.5 miles west of the Lincoln-Franklin County line along U.S. Highway 84, 3.25 miles north of Quentin, 200 feet west of the road, in a wooded area; SE¼SW¼ sec. 20, T. 7 N., R. 5 E.

A—0 to 7 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; common fine roots; few rounded fine and medium chert and quartz pebbles; medium acid; clear smooth boundary.

E—7 to 15 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; common fine roots; few small pebbles; medium acid; clear smooth boundary.

Bt1—15 to 37 inches; red (2.5YR 4/8) sandy clay loam; moderate fine and medium subangular blocky structure; friable; common distinct clay films on faces of peds; sand grains bridged with clay; common fine roots; very strongly acid; gradual smooth boundary.

Bt2—37 to 72 inches; red (2.5YR 4/8) loam; weak medium subangular blocky structure; friable; sand grains bridged with clay; few small pockets of light yellowish brown sand; few pockets of uncoated sand grains; few fine and medium roots; strongly acid.

The thickness of the solum ranges from 60 to more than 100 inches. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon, if it occurs, has value of 5 or 6 and chroma of 2 to 4. It is fine sandy loam, sandy loam, loamy fine sand, or loamy sand.

The upper part of the Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. In some pedons it has few to many mottles in shades of red and brown. It is clay loam, sandy clay loam, or loam. The upper 20 inches of the Bt horizon has 18 to 33 percent clay and 15 to 45 percent silt. The lower part of the Bt horizon has the same range in color as the upper part, except that it commonly has few to many pockets of pale brown to brownish yellow sand grains. It is loam or sandy loam. In some pedons fine to coarse rounded chert or quartz gravel or angular ironstone fragments make up as much as 10 percent of the volume.

Trebloc Series

The Trebloc series consists of poorly drained soils that formed in silty alluvium. These soils are on broad depressional flats on stream terraces. Slopes are 0 to 1 percent. The soils are fine-silty, siliceous, thermic Typic Paleaquults.

Trebloc soils are geographically associated with Bude and Gillsburg soils. Bude soils are in the higher positions on the landscape and are somewhat poorly drained. They have a fragipan. Gillsburg soils are in the lower positions along drainageways. They are browner in the upper part of the subsoil than the Trebloc soils and are coarse-silty.

Typical pedon of Trebloc silt loam, frequently flooded; 2 miles west of Meadville along U.S. Highway 84, 4 miles south on a paved road; 2 miles southeast on a field road, 208 feet west of the road, in a wooded area; 0.1 mile south and 0.25 mile west of the northeast corner of sec. 23, T. 5 N., R. 3 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

E—3 to 9 inches; light brownish gray (10YR 6/2) silt loam; common fine and medium distinct yellowish brown (10YR 5/4), few fine distinct strong brown (7.5YR 5/6), and few medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine and medium subangular blocky structure; friable; common fine roots; strongly acid; gradual wavy boundary.

Btg1—9 to 21 inches; light brownish gray (10YR 6/2) silty clay loam; many medium distinct yellowish brown (10YR 5/4 and 5/6) mottles; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; few fine and medium black concretions; strongly acid; gradual wavy boundary.

Btg2—21 to 35 inches; light gray (10YR 7/2) silty clay; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; few medium black concretions; strongly acid; gradual wavy boundary.

Bt—35 to 62 inches; mottled light gray (10YR 7/2) and yellowish brown (10YR 5/4 and 5/6) silty clay; moderate medium subangular blocky structure; firm;

common distinct clay films on faces of peds; few medium black concretions; strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Reaction is very strongly acid or strongly acid throughout the profile, except in areas where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 or 2.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2, or it is mottled in shades of gray and brown and has no dominant matrix color.

The upper part of the Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 5 or 6. It has few to many mottles in shades of yellow, gray, and brown. It is silt loam or silty clay loam. The lower part of the Btg horizon has the same range in color as the upper part, or it is a Bt horizon that is mottled in shades of gray and brown and has no dominant matrix color. The texture is silt loam, silty clay loam, or silty clay. The particle-size control section, or the upper 20 inches of the Btg horizon, has 20 to 35 percent clay and 35 to 55 percent silt. The Btg horizon commonly has few to many black concretions.

Formation of the Soils

In this section, the factors that influence soil formation are related to the soils in Franklin County and the geology of the survey area is described.

Factors of Soil Formation

The nature of a soil at any given point on the landscape depends upon the combined influence of five major factors of soil formation. These factors are climate, living organisms, parent material, relief, and time *(21)*. All of these factors influence the formation of every soil, but the relative importance of each factor differs from place to place. In extreme cases one factor may dominate the formation of the soil and determine most of its properties. For example, soils that formed in almost pure quartz sand show only faint horizon development.

Climate

The humid, subtropical climate of Franklin County is characteristic of many parts of the southeastern United States. Climate is a genetic factor that affects the physical, chemical, and biological relationships of soils, primarily through precipitation and temperature.

The present character of many soils is a result of internal environment. Differences in internal environment are largely related to the presence or absence of a water table and its depth and duration. Soils that do not have a water table within the solum are browner or redder than those that do. The well drained Ariel, Cahaba, Lexington, Memphis, Ochlockonee, Saffell, and Smithdale soils are examples of soils that do not have a seasonal high water table. Soils that have a seasonal high water table, such as the somewhat poorly drained Bude and Gillsburg soils and the poorly drained Trebloc soils, have grayish colors and yellowish or brownish mottles.

Inundated soils are grayish because they have insufficient oxygen and anaerobic decomposition of organic matter has taken place. Acid and other materials from decomposed organic matter reduce the iron and manganese oxide on soil particles. The soils become grayish, and the oxides become more soluble. Since the free water is not percolating through the soil, some of the reduced iron that is not removed is reoxidized, and mottling occurs when the soil dries. Soils that contain no oxidized iron and manganese are grayish. The red, yellow, or brown streaks or spots are coatings of well oxidized iron or manganese on the soil particles. The amount of water that percolates through the soil depends mainly on rainfall, relative humidity, and the length of the frost-free period. Downward percolation also is affected by physiographic position and by the permeability of the soil.

Temperature and precipitation influence the kind and growth of organisms in and on the soil. They also affect the speed of physical and chemical reactions. These reactions are influenced by the warm, moist weather that prevails most of the year. Because precipitation is plentiful in the county, the soils are subject to leaching and erosion.

Living Organisms

Plant and animal life in and on the soil has helped to change the parent material and thus has influenced the present character of the soil. Among the changes caused by living organisms are gains in organic matter and nutrients and changes in structure and porosity of the soil. Plants add organic matter and nitrogen to the soil. Some plants can take nitrogen from the atmosphere and add it to the soil through the process of decaying of the plant residue. Soil pH is influenced by the plant residue. Products of plant decomposition are an active force in the oxidation and reduction processes, which alter the iron and manganese minerals in the parent material. Bulk density of the soil can change rapidly as a result of vegetation. The darkening and development of an organic surface layer is one of the earliest indications of horizon development.

Animals in the soil convert raw plant residue into humus and mix the humus with the mineral portion of the soil. Burrowing animals also carry the humus deep into the soil as they retreat downward along with the moisture during dry weather. Their tunneling moves mineral material from one horizon of the soil to another.

It also helps to break down and destroy the original structure of the sediments. Tunnels left by animals also facilitate the movement of water through the soils. In Franklin County, earthworms, grubs, and large insects, such as beetles and ants, are the most common types of animals in the soil. Crustacea, such as crayfish, are common in many poorly drained soils.

Microscopic animals contribute to the decomposition of plant residue and help to convert the plant residue to humus. Bacteria also help to convert nitrogen in the soil to forms that make nutrients available to higher plants.

Human activity also influences the formation of soils through the development of agriculture and clearing of the native vegetation. By draining swamps, controlling floods, irrigating, introducing new crops, and using lime and other chemicals, humans have altered the direction of soil formation. The results of these activities on most mineral soils probably will not be evident for many centuries.

Parent Material

The texture and mineralogy of a soil are controlled by the character of the parent material in which it formed. Soil drainage and color also are influenced by the parent material. Where the deposited sediments are loamy in texture, the soils that form also are loamy. Clayey sediments high in montmorillonite develop into clayey soils with montmorillonitic mineralogy, such as Lorman soils. Some changes occur in the texture of the parent material during soil development. In parent materials that have thin strata of contrasting textures, the processes of soil formation mix the contrasting strata so that the developed soil has a more uniform texture than the parent material. The texture of the developed soil, however, remains within the limits of the texture of the parent material.

The soils in Franklin County formed mainly in material transported by the wind, by the sea, or by streams.

Loess is parent material that was deposited by the wind. It has a high content of silt and a low content of sand. The loess in Franklin County is believed to be mainly glacial rock flour that was carried southward and deposited on the broad flood plains along the Mississippi River by the streams formed by melting glaciers of the most recent ice ages. This material was later redeposited, mainly east of the river on top of older marine sediments, by the prevailing westerly winds.

Where loess is unweathered, it is uniform in physical and chemical composition. It is silty, but the soil particles are irregular in shape. Loess deposits vary in thickness but are generally thinner as distance from the Mississippi River increases. Loring and Memphis soils formed entirely in loess. Where the loess is thin, the upper soil horizons formed in weathered loess and the lower soil horizons formed in acid, loamy marine sediments. Bude, Lexington, and Providence soils formed in such materials.

The parent materials in the steeper areas of the county are mainly of marine origin. They are loamy or clayey. The loamy soil materials are mixtures of sand, silt, and clay, and individual soil particles are generally rounded in shape. Lorman soils formed in clayey sediments; Saffell soils formed in gravelly, loamy, and sandy materials; and Smithdale soils formed in loamy marine sediments.

The soils on the flood plains formed in alluvium deposited by streams. They are dominantly silty but are mixed with sand in some areas. Ariel, Collins, Gillsburg, Oaklimeter, and Trebloc soils formed dominantly in silty alluvium. Bruno and Ochlockonee soils formed in sandier alluvium.

Relief

Relief affects soil formation through its influence on soil drainage, erosion, plant cover, and soil temperature. For the most part, elevation in Franklin County ranges from about 120 to 490 feet. In a few places the flood plains and ridges have differences in elevation of only about 40 feet within a square mile, but local differences of 60 to 100 feet are common in other areas.

The steep slopes in the uplands cause rapid runoff from many soils. Thus, relief influences the amount of moisture in soils and the erosion that occurs on the surface. The amount of water that moves through the soil during formation depends partly on relief.

The formation of a fragipan is associated with relief and drainage. Fragipans are compact, brittle horizons in the soil. They are most strongly expressed in level to gently sloping areas. A fragipan restricts the depth to which roots, air, and water can penetrate in the soil and affects permeability and wetness. Bude and Providence soils are examples of soils that have a fragipan.

The flatness of the flood plains has much to do with the slow surface drainage of some soils. Water moves into main channels with difficulty, especially from depressions. In these areas the soils are likely to be grayish and wet. Trebloc soils are wet and have a grayish subsoil.

Because more vegetation typically grows on nearly level soils than on steep soils, nearly level soils have a higher content of organic matter. Organic matter increases the rate of water infiltration, permeability, and the water-holding capacity of the soils.

Time

A long time is generally required for the formation of soils that have distinct horizons. The length of time that the parent material has been in place is commonly reflected in the degree to which the soil profile has developed. Older soils have more distinctly developed soil horizons than younger soils.

The geological age of the soils in Franklin County ranges from young to old. The young soils have undergone very little profile development, and the older soils have well defined horizons.

Soils on the flood plains are young, and they still receive deposits during floods. Among the youngest soils on the flood plains are Bruno, Collins, and Ochlockonee soils. In these soils, horizon differentiation is slight. Except for the darkening of the surface layer, these soils have retained many of the characteristics of their parent material. Ariel, Gillsburg, Oaklimeter, and Trebloc soils are among the older soils on the flood plains. They retain many of the characteristics of the parent material but have weakly defined horizons.

The soils on uplands are generally much older than those on the flood plains. Lexington, Memphis, Loring, Providence, and Smithdale soils are examples of older soils on uplands. These soils have profiles that have well defined horizons and that bear little resemblance to the original parent material. Over time, however, the soil profile, especially that of steep soils, may be altered by geologic erosion.

Geology

Robert K. Merrill, geologist, Mississippi Bureau of Geology, prepared this section.

This section describes the physiography, relief, drainage, and general geology of Franklin County.

Physiography

Mississippi is in two major regional physiographic divisions *(10)*. These are the East Gulf Coastal Plain and the Mississippi Alluvial Plain, which are part of the Coastal Plain Province. The state has been subdivided into several local physiographic districts in earlier geologic studies *(7, 14, 20)*. Although nomenclature of the physiographic districts varies, each classification reflects the topography over the various lithologies present in geologic units in different parts of the state. Franklin County is in the Loess Hills and Southern Pine Hills physiographic districts *(10)*.

The Loess Hills physiographic district is underlain by well sorted silt that maintains a very steep to vertical angle of repose in artificial excavations, such as road cuts, railroad cuts, and borrow pits. Natural weathering produces very hilly and rugged terrain with steep, often vertical, bluffs along the Mississippi River valley and adjoining tributaries. The thickest accumulations of loess occur in the uplands along the eastern border of the Mississippi Alluvial Plain *(19)*. Areas underlain by the thickest accumulations of loess are included in the Loess Hills physiographic district, although thinner accumulations extend a significant distance to the east. The Loess Hills physiographic district occupies the northwest corner of Franklin County. The rest of the county is in the Southern Pine Hills physiographic district.

The Southern Pine Hills physiographic district occupies most of the land area in the southern half of Mississippi. This region is underlain primarily by sands and clays of Miocene age and gravels, sands, and clays of Pleistocene age.

Relief

The elevation is about 505 feet above sea level in small areas of north-central and southeastern Franklin County in the very hilly terrain that developed on Citronelle gravel and sand deposits. The lowest elevations in the county, about 95 feet above sea level, are on the flood plain and channel of the Homochitto River, near the southwestern boundary between Franklin County and Adams and Wilkinson Counties. Thus, the total county-wide relief is about 410 feet.

Relief varies locally as rates and amounts of erosion differ with respect to types of underlying sediments. Areas that are underlain by fluvial terrace pebbles and sands and well sorted silt (loess) deposits are characterized by very hilly and rugged terrain and by narrow ridges and steep valley walls produced by the downcutting of streams into the soft sediments. Relief commonly exceeds 100 feet within one-half mile of horizontal distance in these areas. Clays, silts, and fine grained sands characteristic of the majority of Miocene-age sediments in Franklin County generally produce gently rolling terrain with broad hilltops and gently sloping hillsides.

Drainage

Franklin County is drained primarily by the Homochitto River and its tributaries. The Homochitto River flows westward from Franklin County and joins the Mississippi River about 18 miles south of Natchez, Mississippi. The main tributaries of the Homochitto River extend northward in Franklin County in a highly dendritic drainage pattern. These tributaries are, from east to west, Molls Creek, Fifteen Mile Creek, McCall Creek, McGehee Creek, Goober Creek, Cane Mill Branch, Porter Creek, Middleton Creek, Brush Creek,

Middle Fork, Cameron Creek, Morgan Fork, Dry Creek, and Dry Bayou. Coles Creek extends into the northwest corner of Franklin County and flows to the northwest through Adams and Jefferson Counties. It joins the Mississippi River about 14 miles north of Natchez.

The main stream valley of the Homochitto River trends parallel to the east-west strike of the underlying Miocene units in southwestern Franklin County and throughout its course to the Mississippi River. Main tributaries of the stream extend northward through Franklin County approximately perpendicular to the regional strike of Miocene units, and downcutting has dissected younger, Pleistocene-age strata into a ridge system that trends from north to south.

General Geology

Stratigraphic units that occur at the surface of Franklin County are primarily of Miocene, Pleistocene, or Recent age *(3)*. Table 23 illustrates the vertical relationships of the geologic units. Miocene units consist of clays, sands, and occasional pebbles contained in the Hattiesburg and Pascagoula Formations. Pleistocene strata consist of fluvial sands and pebbles in the Citronelle Formation, pre-loess terrace deposits, and silty loess deposits. The geologic age of the Citronelle Formation, whether Pliocene or Pleistocene, has been a subject of much debate. A Pleistocene age is utilized in this report in keeping with most of the recent literature concerning the unit in southwestern Mississippi.

The oldest unit that occurs at the surface of Franklin County is the Hattiesburg Formation of Middle Miocene age. This unit consists of thick sequences of silty clay with some thin intervals of sand. Clay intervals in the Hattiesburg Formation are commonly silty where exposed in the valley walls of streams in northern Franklin County and are bluish gray to light gray when fresh. Sandy intervals consist of very fine grained to medium grained quartz sand and are commonly laterally discontinuous. They are thin (less than 8 feet thick) and are very light gray when fresh. Iron staining imposes a red hue to these sediments upon weathering. Thin ironstone layers develop on the uppermost surfaces of clay intervals as downward movement of iron is retarded by less permeable clays and iron oxides precipitate. The Hattiesburg Formation is 450 feet thick in Adams County to the west *(27)* and 400 feet thick in Copiah County to the northeast *(4)*. Thus, the unit thickens slightly toward the west in the Franklin County area. Regional strike is generally east-west (N. 90 W.) with considerable variation, and regional dip is approximately 30 feet per mile southward near the Mississippi River *(27)*. Only the upper intervals of the Hattiesburg Formation are exposed in Franklin County. The contact with the overlying Pascagoula Formation is obscured by Pleistocene fluvial terraces, loess deposits, and weathering.

Contact between the Hattiesburg and Pascagoula Formations occurs in the valley walls of Sandy Creek in western Franklin County and eastern Adams County as bluish gray silty clay overlain by light gray sand. This contact interval is described by Vestal and McCutcheon *(27)* in eastern Adams County. Exposures of bluish gray clays characteristic of the uppermost intervals of the Hattiesburg Formation were observed during fieldwork for this study, although unaltered, clearly distinct examples of the contact were not observed in Franklin County. The contact can only be inferred from the lateral distribution of the respective lithologies. Similarly, the actual contact between Miocene-age strata in Copiah County *(4)* and in Forrest County to the east *(11)* could not be accurately located, primarily because of weathering and truncation by overlying fluvial terrace deposits. The Hattiesburg and Pascagoula Formations are therefore not differentiated. The Hattiesburg-Pascagoula contact is reported to be unconformable in Adams County *(27)*.

The Pascagoula Formation is composed primarily of clay with frequent intervals of sand, sandstone, and silt. The clays are generally bluish gray or greenish gray, are locally lignitic, and commonly contain varying amounts of silt and sand. Some intervals of sandstone 5 to 8 feet thick formed because of the retardation of downward percolation of silica-bearing water by underlying less permeable clays, resulting in the formation of interstitial silica cement in the sand. Intervals of unconsolidated, cross-bedded, glauconitic sand occur in exposures in the central and southern parts of Franklin County. The sand intervals are commonly replaced laterally by intervals of clay and thinly interbedded sand and clay. Exposures of the Pascagoula Formation occur at the lower elevations in the southern two-thirds of Franklin County, although laterally continuous unweathered exposures of significant thickness are unusual. The Pascagoula Formation attains a maximum thickness of 400 feet in western Mississippi.

Miocene strata exposed in the Franklin County area are unconformably overlain by fluvial gravels, sands, and clays contained in the Citronelle Formation and pre-loess terrace deposits. The age of the Citronelle Formation in Mississippi is questionable because of a lack of fossil evidence and other datable material. A Pleistocene age is utilized in this report. Citronelle sediments are composed of chert and quartz gravel in a matrix of quartz sand, with occasional clay beds and lenses. Citronelle strata cap many of the hilltops in Franklin County, and the loosely consolidated pebbles

and sands produce very hilly terrain. The unit attains a maximum thickness of about 90 feet in Franklin County. The Citronelle Formation is older than the pre-loess terrace deposits and occurs at higher elevations. The two units can sometimes be distinguished on the basis of elevation, although pre-loess deposits in this area commonly occur at comparable elevations, and the units may even adjoin *(4)*.

Pre-loess terrace deposits are fluvial gravels, sands, and clays of Pleistocene age. These sediments are reddish brown and are commonly overlain by yellowish brown silt. Silicified wood occurs near the base of pre-loess terrace deposits in Hinds County *(17)*. This unit generally occurs at lower elevations than the Citronelle Formation and is exposed adjacent to present stream courses.

Fluvial pebbles and sands comprising Citronelle and pre-loess terrace deposits are unconformably overlain by the loess deposits. Loess deposits in Mississippi are primarily composed of silt-sized quartz and feldspar *(19)*. Loess deposits are typically yellowish brown and contrast with the reddish brown sands prevalent in the underlying fluvial terrace deposits (Citronelle and pre-loess terraces). The loess blankets hilltops, valley walls, and many areas of lower elevation in the western half of Franklin County. The thickest loess deposits in Mississippi (commonly exceeding 100 feet) occur at Vicksburg. The thickest loess accumulations in western Franklin County generally range between 15 and 20 feet, and the loess thins to a laterally discontinuous interval less than 5 feet thick in eastern portions of the county. A maximum thickness of 8 feet occurs in Copiah County *(4)*. Loess accumulations exceed 90 feet near the bluffs of the Mississippi River in Adams County *(27)*. Loess was derived from glacial outwash deposited on Pleistocene Mississippi-Ohio River valley flats by braided streams. Prevailing winds carried silt eastward, where it settled on maturely dissected uplands bordering the eastern side of what is now the Mississippi Alluvial Valley *(19)*.

Alluvium occupies the lowermost, flat areas of stream valleys in and adjacent to present stream courses. Flood plains attain maximum development in downstream portions of stream valleys and become thinner and narrower in areal extent toward the upstream limits. There is generally no alluvium in the uppermost reaches of present stream courses where intermittent streams have downcut into soft Miocene and Pleistocene sediments. The flood plain along the Homochitto River is about 2 miles in width in southwestern Franklin County. Recent alluvium in Franklin County consists of a fining upward sequence of gravel, sands, and clays. The alluvium is commonly more than 50 feet thick in the larger stream valleys of southwestern Mississippi. On the Bayou Pierre alluvial plain, the alluvium averages between 1 and 2 miles in width. It attains a maximum thickness of 75 feet in Copiah County *(4)*.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles

(flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness

markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser

depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level

plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water

to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine

sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-81 at Liberty, Mississippi)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	58.4	35.3	46.9	78	13	128	4.93	2.52	7.03	8	0.1
February----	62.7	37.4	50.1	81	17	146	4.82	2.59	6.78	7	.2
March-------	69.8	44.2	57.0	84	23	251	5.79	2.34	8.69	7	.2
April-------	78.1	53.4	65.8	89	34	474	5.38	1.92	8.24	5	.0
May---------	84.1	60.1	72.1	94	42	685	5.38	2.84	7.60	6	.0
June--------	90.4	66.3	78.4	98	53	852	4.51	1.69	6.86	6	.0
July--------	91.8	69.5	80.7	100	62	952	5.76	3.51	7.78	10	.0
August------	91.5	68.2	79.9	98	57	927	4.46	2.21	6.41	8	.0
September---	87.8	64.1	76.0	96	47	780	4.27	1.56	6.51	6	.0
October-----	79.6	50.9	65.3	93	30	474	2.57	.71	4.08	3	.0
November----	69.0	42.7	55.9	85	22	209	4.31	1.67	6.52	5	.0
December----	61.1	36.7	48.9	80	16	98	5.98	3.65	8.06	7	.0
Yearly:											
Average---	77.0	52.4	64.8	---	---	---	---	---	---	---	---
Extreme---	---	---	---	101	13	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,976	58.16	46.52	68.62	78	.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-81 at Liberty, Mississippi)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Mar. 18	Mar. 26	Apr. 4
2 years in 10 later than--	Mar. 7	Mar. 17	Mar. 30
5 years in 10 later than--	Feb. 14	Mar. 2	Mar. 21
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 16	Oct. 31	Oct. 24
2 years in 10 earlier than--	Nov. 22	Nov. 6	Oct. 28
5 years in 10 earlier than--	Dec. 4	Nov. 17	Nov. 5

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-81 at Liberty, Mississippi)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	253	230	211
8 years in 10	267	241	217
5 years in 10	292	260	229
2 years in 10	317	280	240
1 year in 10	331	290	247

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
5	Oaklimeter silt loam, occasionally flooded	9,015	2.5
9	Bruno sandy loam, frequently flooded	505	0.1
10	Ariel silt loam, occasionally flooded	13,425	3.7
11	Collins silt loam, occasionally flooded	995	0.3
12	Bruno sandy loam, occasionally flooded	7,000	1.9
13	Ochlockonee fine sandy loam, occasionally flooded	925	0.3
14	Gillsburg silt loam, occasionally flooded	24,300	6.7
23A	Cahaba sandy loam, 0 to 3 percent slopes	1,385	0.4
30B2	Memphis silt loam, 2 to 5 percent slopes, eroded	800	0.2
30C2	Memphis silt loam, 5 to 8 percent slopes, eroded	1,260	0.4
30F1	Memphis silt loam, 15 to 35 percent slopes	870	0.2
30F2	Memphis silt loam, 8 to 45 percent slopes, eroded	1,975	0.5
31A	Loring silt loam, 0 to 2 percent slopes	335	0.1
31B2	Loring silt loam, 2 to 5 percent slopes, eroded	10,995	3.0
31C2	Loring silt loam, 5 to 8 percent slopes, eroded	16,535	4.6
38D1	Smithdale sandy loam, 8 to 15 percent slopes	11,395	3.1
38F1	Smithdale sandy loam, 15 to 40 percent slopes	101,205	27.9
51A1	Providence silt loam, 0 to 2 percent slopes	1,045	0.3
51B2	Providence silt loam, 2 to 5 percent slopes, eroded	28,665	7.9
51C2	Providence silt loam, 5 to 8 percent slopes, eroded	17,395	4.8
53	Providence silt loam, 2 to 8 percent slopes, eroded	19,000	5.2
54	Kolin silt loam, 2 to 8 percent slopes, eroded	990	0.3
56A	Bude silt loam, 0 to 2 percent slopes	5,075	1.4
69F	Smithdale-Lexington association, 5 to 40 percent slopes	13,560	3.7
70F	Smithdale-Lexington-Memphis association, 5 to 40 percent slopes	5,500	1.5
72F1	Saffell gravelly sandy loam, 15 to 40 percent slopes	27,150	7.5
73D1	Lorman silt loam, 8 to 15 percent slopes	1,810	0.5
73F1	Lorman silt loam, 15 to 35 percent slopes	25,745	7.1
78F	Lorman and Smithdale soils, 15 to 35 percent slopes	6,725	1.9
80	Riverwash	3,795	1.1
94	Trebloc silt loam, frequently flooded	2,800	0.8
95	Pits-Udorthents complex	80	*
	Water	345	0.1
	Total	362,600	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
5	Oaklimeter silt loam, occasionally flooded (where protected from flooding or not frequently flooded during the growing season)
10	Ariel silt loam, occasionally flooded
11	Collins silt loam, occasionally flooded (where protected from flooding or not frequently flooded during the growing season)
13	Ochlockonee fine sandy loam, occasionally flooded (where protected from flooding or not frequently flooded during the growing season)
14	Gillsburg silt loam, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
23A	Cahaba sandy loam, 0 to 3 percent slopes
30B2	Memphis silt loam, 2 to 5 percent slopes, eroded
31A	Loring silt loam, 0 to 2 percent slopes
31B2	Loring silt loam, 2 to 5 percent slopes, eroded
51A1	Providence silt loam, 0 to 2 percent slopes
51B2	Providence silt loam, 2 to 5 percent slopes, eroded
56A	Bude silt loam, 0 to 2 percent slopes

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Wheat	Cotton lint	Soybeans	Common bermuda-grass	Improved bermuda-grass	Bahiagrass
		Bu	Bu	Lbs	Bu	AUM*	AUM*	AUM*
5--------------- Oaklimeter	IIw	95	40	750	40	9.0	11.0	10.0
9--------------- Bruno	Vw	---	---	---	---	3.0	3.5	3.0
10-------------- Ariel	IIw	110	40	800	40	9.0	11.0	10.0
11-------------- Collins	IIw	110	40	800	40	9.0	11.0	10.0
12-------------- Bruno	IIIs	50	30	400	20	3.0	4.0	3.0
13-------------- Ochlockonee	IIw	110	40	750	40	7.0	8.0	7.5
14-------------- Gillsburg	IIw	100	35	750	40	7.0	10.0	8.5
23A------------- Cahaba	I	100	35	800	35	8.0	10.0	8.5
30B2------------ Memphis	IIe	95	35	750	35	8.5	10.0	9.0
30C2------------ Memphis	IIIe	80	30	700	30	8.0	9.0	8.5
30F1------------ Memphis	VIIe	---	---	---	---	4.5	6.0	4.5
30F2------------ Memphis	VIe	---	---	---	---	4.5	6.0	4.5
31A------------- Loring	IIw	100	45	750	40	9.0	10.0	9.0
31B2------------ Loring	IIe	90	35	700	35	8.0	10.0	8.5
31C2------------ Loring	IIIe	75	30	600	25	7.5	9.0	8.0
38D1------------ Smithdale	IVe	55	20	400	20	5.0	8.0	8.0
38F1------------ Smithdale	VIIe	---	---	---	---	4.0	6.0	4.5
51A1------------ Providence	IIw	90	40	750	40	8.5	10.0	9.0
51B2------------ Providence	IIe	85	35	700	35	8.0	9.5	8.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Wheat	Cotton lint	Soybeans	Common bermuda-grass	Improved bermuda-grass	Bahiagrass
		Bu	Bu	Lbs	Bu	AUM*	AUM*	AUM*
51C2, 53--------Providence	IIIe	70	30	500	25	7.5	9.0	8.0
54--------------Kolin	IVe	---	---	---	---	5.0	6.5	6.0
56A-------------Bude	IIw	85	35	625	25	7.0	9.0	7.0
69F:								
Smithdale------	VIIe	---	---	---	---	4.0	5.0	4.0
Lexington------	VIe	---	---	---	---	4.5	6.0	4.5
70F:								
Smithdale------	VIIe	---	---	---	---	4.0	5.0	4.0
Lexington------	VIe	---	---	---	---	4.5	6.0	4.5
Memphis--------	VIe	---	---	---	---	5.0	6.5	5.0
72F1------------Saffell	VIIe	---	---	---	---	---	---	---
73D1------------Lorman	VIe	---	---	---	---	3.0	6.0	4.0
73F1------------Lorman	VIIe	---	---	---	---	3.0	4.0	4.0
78F-------------Lorman and Smithdale	VIIe	---	---	---	---	3.0	4.0	4.0
80. Riverwash								
94--------------Trebloc	Vw	---	---	---	---	4.5	---	---
95. Pits-Udorthents								

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	1,385	---	---	---	---
II	95,575	40,460	55,115	---	---
III	61,190	54,190	---	7,000	---
IV	12,385	12,385	---	---	---
V	3,305	---	3,305	---	---
VI	10,086	10,086	---	---	---
VII	174,452	174,452	---	---	---
VIII	---	---	---	---	---

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
5---------------- Oaklimeter	10A	Slight	Slight	Moderate	Severe	Cherrybark oak------	100	10	Cherrybark oak, eastern cottonwood, loblolly pine, Nuttall oak, sweetgum, water oak, yellow-poplar.
						Eastern cottonwood--	100	9	
						Green ash-----------	90	4	
						Loblolly pine-------	90	9	
						Nuttall oak---------	100	---	
						Willow oak----------	100	7	
						Sweetgum------------	100	10	
9---------------- Bruno	8S	Slight	Slight	Moderate	Moderate	Cherrybark oak------	90	8	Cherrybark oak, Shumard oak, willow oak, sweetgum, yellow-poplar, loblolly pine, eastern cottonwood, black willow, American sycamore.
						Water oak-----------	90	6	
						Sweetgum------------	94	8	
						Willow oak----------	90	6	
						River birch---------	---	---	
						Yellow-poplar-------	94	7	
						Loblolly pine-------	93	10	
						American sycamore---	100	9	
						Eastern cottonwood--	110	11	
						Black willow--------	---	---	
10--------------- Ariel	10A	Slight	Slight	Slight	Severe	Loblolly pine-------	95	10	Loblolly pine, cherrybark oak, eastern cottonwood, sweetgum, water oak, yellow-poplar, green ash.
						Cherrybark oak------	110	13	
						Eastern cottonwood--	115	12	
						Sweetgum------------	100	10	
						Water oak-----------	105	7	
						Yellow-poplar-------	110	9	
11--------------- Collins	4A	Slight	Slight	Slight	Severe	Green ash-----------	95	4	Green ash, eastern cottonwood, cherrybark oak, yellow-poplar, loblolly pine.
						Eastern cottonwood--	115	---	
						Cherrybark oak------	110	4	
12--------------- Bruno	8S	Slight	Slight	Moderate	Moderate	Cherrybark oak------	90	8	Cherrybark oak, Shumard oak, willow oak, sweetgum, yellow-poplar, loblolly pine.
						Water oak-----------	90	6	
						Sweetgum------------	94	8	
						Willow oak----------	90	6	
						River birch---------	---	---	
						Yellow-poplar-------	94	7	
						Loblolly pine-------	93	10	
						American sycamore---	100	9	
						Eastern cottonwood--	110	11	
						Black willow--------	---	---	
13--------------- Ochlockonee	11A	Slight	Slight	Slight	Severe	Loblolly pine-------	100	11	Loblolly pine, eastern cottonwood, yellow-poplar, sweetgum.
						Eastern cottonwood--	100	9	
						Yellow-poplar-------	110	9	
						Slash pine----------	100	13	
						Sweetgum------------	90	7	
						Water oak-----------	80	5	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
14------------- Gillsburg	10W	Slight	Moderate	Moderate	Severe	Cherrybark oak------	100	10	Eastern
						Eastern cottonwood--	100	9	cottonwood,
						Green ash-----------	90	4	loblolly pine,
						Loblolly pine-------	90	9	sweetgum,
						Sweetgum------------	90	7	American
						American sycamore---	105	10	sycamore,
						Water oak-----------	100	7	yellow-poplar,
						Yellow-poplar-------	105	8	cherrybark
						Nuttall oak---------	110	7	oak.
23A------------ Cahaba	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	87	9	Loblolly pine,
						Slash pine----------	91	12	slash pine,
						Shortleaf pine------	70	8	sweetgum,
						Yellow-poplar-------	---	---	water oak,
						Sweetgum------------	90	7	shortleaf
						Southern red oak----	---	---	pine.
						Water oak-----------	---	---	
30B2, 30C2------ Memphis	12A	Slight	Slight	Slight	Severe	Loblolly pine-------	105	12	Cherrybark oak,
						Cherrybark oak------	100	10	loblolly pine,
						Sweetgum------------	90	7	yellow-poplar,
									white oak.
30F1, 30F2------ Memphis	12R	Severe	Moderate	Slight	Severe	Loblolly pine-------	105	12	Cherrybark oak,
						Cherrybark oak------	90	8	loblolly pine,
						Sweetgum------------	105	11	yellow-poplar.
31A, 31B2------- Loring	10A	Slight	Moderate	Slight	Severe	Loblolly pine-------	95	10	Loblolly pine,
						Southern red oak----	75	4	shortleaf
						Cherrybark oak------	86	7	pine,
						Sweetgum------------	90	7	cherrybark
						Water oak-----------	90	6	oak,
									yellow-poplar,
									sweetgum.
31C2------------ Loring	10R	Moderate	Moderate	Slight	Severe	Loblolly pine-------	95	10	Loblolly pine,
						Southern red oak----	75	4	shortleaf
						Cherrybark oak------	86	7	pine,
						Sweetgum------------	90	7	cherrybark
						Water oak-----------	90	6	oak,
									yellow-poplar,
									sweetgum.
38D1------------ Smithdale	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine,
						Longleaf pine-------	69	5	longleaf pine,
						Slash pine----------	85	11	slash pine,
									southern red
									oak, white
									oak.
38F1------------ Smithdale	9R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine,
						Longleaf pine-------	69	5	longleaf pine,
						Slash pine----------	85	11	slash pine,
									southern red
									oak.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
51A1, 51B2------ Providence	9W	Slight	Slight	Slight	Severe	Loblolly pine-------	87	9	Loblolly pine, Shumard oak, sweetgum, yellow-poplar.
						Longleaf pine-------	73	6	
						Sweetgum------------	90	7	
51C2, 53-------- Providence	9W	Moderate	Slight	Slight	Severe	Loblolly pine-------	87	9	Loblolly pine, Shumard oak, sweetgum, yellow-poplar.
						Longleaf pine-------	73	6	
						Sweetgum------------	90	7	
54-------------- Kolin	8A	Slight	Slight	Slight	Severe	Loblolly pine-------	85	8	Loblolly pine, slash pine, sweetgum.
						Longleaf pine-------	---	---	
						Slash pine----------	---	---	
						Sweetgum------------	---	---	
						White oak-----------	---	---	
						Southern red oak----	---	---	
56A------------- Bude	10W	Slight	Moderate	Slight	Severe	Loblolly pine-------	98	10	Loblolly pine, sweetgum, cherrybark oak, southern red oak.
69F:									
Smithdale------	9R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine, longleaf pine, slash pine, southern red oak.
						Longleaf pine-------	69	5	
						Slash pine----------	85	11	
Lexington------	10R	Moderate	Moderate	Slight	Severe	Loblolly pine-------	95	10	Loblolly pine, yellow-poplar, cherrybark oak, sweetgum.
						Southern red oak----	80	4	
						Cherrybark oak------	86	7	
						Sweetgum------------	90	7	
70F:									
Smithdale------	9R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine, longleaf pine, slash pine, southern red oak.
						Longleaf pine-------	69	5	
						Slash pine----------	85	11	
Lexington------	10R	Moderate	Moderate	Slight	Severe	Loblolly pine-------	95	10	Loblolly pine, yellow-poplar, cherrybark oak, sweetgum.
						Southern red oak----	80	4	
						Cherrybark oak------	86	7	
						Sweetgum	90	7	
Memphis--------	12R	Severe	Moderate	Slight	Slight	Loblolly pine-------	105	12	Cherrybark oak, loblolly pine, yellow-poplar.
						Cherrybark oak------	90	8	
						Sweetgum------------	105	11	
72F1------------ Saffell	6R	Slight	Moderate	Moderate	Slight	Loblolly pine-------	67	6	Loblolly pine, shortleaf pine, southern red oak.
						Longleaf pine-------	---	---	
						Water oak-----------	---	---	
						Southern red oak----	---	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
73D1------------ Lorman	8C	Slight	Moderate	Slight	Severe	Loblolly pine-------	80	8	Loblolly pine, shortleaf pine, slash pine, southern red oak.
						Shortleaf pine------	70	8	
73F1------------ Lorman	8R	Moderate	Moderate	Slight	Severe	Loblolly pine-------	80	8	Loblolly pine, shortleaf pine, slash pine, southern red oak.
						Shortleaf pine------	70	8	
78F:									
Lorman---------	8R	Moderate	Moderate	Slight	Severe	Loblolly pine-------	80	8	Loblolly pine, shortleaf pine, slash pine, southern red oak.
						Shortleaf pine------	70	8	
Smithdale------	9R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine, longleaf pine, slash pine, southern red oak.
						Longleaf pine-------	69	5	
						Slash pine----------	85	11	
94-------------- Trebloc	10W	Slight	Moderate	Severe	Severe	Loblolly pine-------	95	10	Green ash, loblolly pine, Nuttall oak, Shumard oak, sweetgum, water oak, willow oak.
						Sweetgum------------	90	7	
						Water oak-----------	85	6	
						Willow oak----------	80	5	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION

(Only the soils suitable for production of commercial trees are listed)

Soil name and map symbol	Total production (Dry weight)	Characteristic vegetation	Composition
	Lb/acre		Pct
5 Oaklimeter	1,500	Beaked panicum	6
		Pinehill bluestem	33
		Switchcane	26
		Longleaf uniola	20
9 Bruno	1,100	Longleaf uniola	40
		Beaked panicum	25
		Pinehill bluestem	15
10 Ariel	1,500	Beaked panicum	6
		Pinehill bluestem	33
		Switchcane	26
		Longleaf uniola	20
11 Collins	1,600	Pinehill bluestem	25
		Longleaf uniola	31
		Beaked panicum	19
		Panicum	6
		Switchcane	19
12 Bruno	1,100	Longleaf uniola	40
		Beaked panicum	25
		Pinehill bluestem	15
13 Ochlockonee	1,300	Pinehill bluestem	46
		Longleaf uniola	23
		Beaked panicum	11
		Panicum	8
14 Gillsburg	1,500	Switchcane	27
		Longleaf uniola	20
		Beaked panicum	7
		Pinehill bluestem	33
23A Cahaba	1,300	Pinehill bluestem	23
		Longleaf uniola	23
		Beaked panicum	12
		Panicum	8
30B2, 30C2, 30F1, 30F2 Memphis	1,600	Beaked panicum	19
		Longleaf uniola	31
		Switchcane	19
		Panicum	6
		Pinehill bluestem	25
31A, 31B2, 31C2 Loring	1,600	Beaked panicum	31
		Pinehill bluestem	25
		Longleaf uniola	19
		Switchcane	19
38D1, 38F1 Smithdale	1,300	Pinehill bluestem	46
		Beaked panicum	15
		Panicum	12
		Slender bluestem	15

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production (Dry weight)	Characteristic vegetation	Composition
	Lb/acre		Pct
51A1, 51B2, 51C2, 53 Providence	1,600	Beaked panicum	31
		Pinehill bluestem	25
		Longleaf uniola	19
		Switchcane	19
54 Kolin	1,600	Pinehill bluestem	25
		Switchcane	19
		Beaked panicum	31
		Longleaf uniola	19
56A Bude	1,800	Pinehill bluestem	33
		Switchcane	27
		Longleaf uniola	20
		Beaked panicum	7
69F:			
Smithdale	1,300	Pinehill bluestem	25
		Beaked panicum	15
		Panicum	12
Lexington	1,600	Pinehill bluestem	25
		Beaked panicum	31
		Longleaf uniola	19
		Switchcane	19
		Panicum	6
70F:			
Smithdale	1,300	Pinehill bluestem	46
		Beaked panicum	15
		Panicum	12
		Slender bluestem	15
Lexington	1,600	Pinehill bluestem	25
		Beaked panicum	31
		Longleaf uniola	19
		Switchcane	19
		Panicum	6
Memphis	1,600	Beaked panicum	19
		Longleaf uniola	31
		Switchcane	19
		Pinehill bluestem	25
72F1 Saffell	1,000	Sedge	5
		Bluestem	20
		Uniola	15
		Virginia wildrye	10
		Beaked panicum	10
		Indiangrass	5
		Panicum	5
73D1, 73F1 Lorman	1,000	Pinehill bluestem	30
		Longleaf uniola	36
		Beaked panicum	15
		Panicum	10
		Slender bluestem	5

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production (Dry weight)	Characteristic vegetation	Composition
	Lb/acre		Pct
78F:			
Lorman	1,000	Pinehill bluestem	30
		Longleaf uniola	30
		Beaked panicum	15
		Panicum	10
		Slender bluestem	5
Smithdale	1,300	Pinehill bluestem	46
		Beaked panicum	15
		Panicum	12
		Slender bluestem	15
94 Trebloc	1,200	Pinehill bluestem	25
		Cutover muhly	17
		Longleaf uniola	17
		Beaked panicum	9

TABLE 10.--SUITABILITY OF THE SOILS FOR TREES USED IN ENVIRONMENTAL PLANTINGS

(The numeral 1 indicates that the soil is well suited to the species, the numeral 2 indicates that the soil is suited, and the numeral 3 indicates that the soil is poorly suited. Absence of an entry indicates that information was not available)

Soil name and map symbol	Expected height at 20 years of age: More than 50 feet						30 to 50 feet					15 to 30 feet			
	Loblolly pine	Red maple	Southern magnolia	Southern red oak	Water oak	Yellow-poplar	Black cherry	Live oak	Pecan	Red mulberry	Sweetbay	American holly	Flowering dogwood	Common sassafras	Redbud
5----------- Oaklimeter	1	1	1	1	1	1	1	1	1	1	1	1	1	2	---
9----------- Bruno	3	3	3	2	1	1	3	1	3	2	3	2	2	1	3
10---------- Ariel	1	1	1	2	1	1	1	2	1	1	1	1	1	1	2
11---------- Collins	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12. Bruno															
13---------- Ochlockonee	1	1	3	1	1	1	1	1	1	2	3	2	2	1	2
14---------- Gillsburg	1	1	1	3	1	2	2	1	2	2	1	2	2	2	2
23---------- Cahaba	1	1	2	1	2	1	1	1	1	1	2	2	1	1	1
30B2, 30C2, 30F1, 30F2- Memphis	1	1	2	2	2	1	1	1	1	2	2	2	1	2	1
31A, 31B2, 31C2------- Loring	1	2	3	2	2	3	2	1	2	2	3	2	2	1	2
38D1, 38F1. Smithdale															
51A, 51B2, 51C2, 53--- Providence	1	2	3	1	2	2	2	1	3	3	3	2	2	2	2
54---------- Kolin	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

TABLE 10.--SUITABILITY OF THE SOILS FOR TREES USED IN ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Expected height at 20 years of age														
	More than 50 feet						30 to 50 feet					15 to 30 feet			
	Loblolly pine	Red maple	Southern magnolia	Southern red oak	Water oak	Yellow-poplar	Black cherry	Live oak	Pecan	Red mulberry	Sweetbay	American holly	Flowering dogwood	Common sassafras	Redbud
56A--------- Bude	1	2	2	3	1	3	3	1	3	2	2	2	2	3	2
69F:															
Smithdale--	2	3	3	2	3	2	3	1	2	2	3	2	2	1	1
Lexington--	1	2	2	2	2	1	2	1	1	1	2	2	2	1	2
70F:															
Smithdale--	2	3	3	2	3	2	3	1	2	2	3	2	2	1	1
Lexington--	1	2	2	2	2	1	2	1	1	1	2	2	2	1	2
Memphis----	1	1	2	2	2	1	1	1	1	2	2	2	1	2	1
72F1-------- Saffell	2	3	3	2	3	3	3	2	3	3	3	3	3	2	3
73D1, 73F1-- Lorman	2	2	2	2	3	3	2	2	2	2	2	2	2	3	2
78F:															
Lorman-----	2	2	2	2	3	3	2	2	2	2	2	2	2	3	2
Smithdale--	2	3	3	2	3	2	3	1	2	2	3	2	2	1	1
80. Riverwash															
94---------- Trebloc	3	2	2	3	2	3	3	3	3	3	2	---	---	---	---
95. Pits- Udorthents															

TABLE 11.--SUITABILITY OF THE SOILS FOR ORNAMENTAL SHRUBS USED IN ENVIRONMENTAL PLANTINGS

(The numeral 1 indicates that the soil is well suited to the specified plant, the numeral 2 indicates that the soil is suited, and the numeral 3 indicates that the soil is poorly suited. Absence of an entry indicates that information was not available)

Soil name and map symbol	Azaleas	Camellia	Crape-myrtle	Glossy abelia	Holly	Nandina	Pyracantha	Rose	Waxmyrtle
5----------- Oaklimeter	2	2	1	1	1	1	2	1	1
9. Bruno									
10---------- Ariel	1	1	1	1	1	1	1	1	1
11---------- Collins	2	2	1	1	1	2	2	1	1
12. Bruno									
13---------- Ochlockonee	1	1	1	1	1	1	1	2	1
14---------- Gillsburg	1	1	1	1	2	2	2	2	2
23A--------- Cahaba	1	1	1	1	1	1	1	1	1
30B2, 30C2, 30F1, 30F2- Memphis	1	1	1	1	1	1	1	1	1
31A, 31B2, 31C2------- Loring	1	1	1	1	1	1	1	1	1
38D1, 38F1. Smithdale									
51A, 51B2, 51C2, 53--- Providence	1	1	1	1	1	1	1	2	1
54---------- Kolin	2	2	2	2	2	2	2	2	2
56---------- Bude	2	2	2	2	3	2	2	3	2
69F:									
Smithdale--	1	1	1	1	1	1	1	2	1
Lexington--	1	1	1	1	1	1	1	1	1
70F:									
Smithdale--	1	1	1	1	1	1	1	2	1
Lexington--	1	1	1	1	1	1	1	1	1
Memphis----	1	1	1	1	1	1	1	1	1
72F1. Saffell									

TABLE 11.--SUITABILITY OF THE SOILS FOR ORNAMENTAL SHRUBS USED IN ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Azaleas	Camellia	Crape-myrtle	Glossy abelia	Holly	Nandina	Pyracantha	Rose	Waxmyrtle
73D1, 73F1-- Lorman	1	2	1	1	1	1	1	3	2
78F:									
Lorman-----	1	2	1	1	1	1	1	3	2
Smithdale--	1	1	1	1	1	1	1	2	1
80. Riverwash									
94. Trebloc									
95. Pits-Udorthents									

TABLE 12.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
5 Oaklimeter	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
9 Bruno	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
10 Ariel	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight	Moderate: flooding.
11 Collins	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight	Moderate: flooding.
12 Bruno	Slight	Slight	Moderate: flooding.	Slight	Moderate: droughty, flooding.
13 Ochlockonee	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
14 Gillsburg	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
23A Cahaba	Slight	Slight	Slight	Slight	Slight.
30B2 Memphis	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
30C2 Memphis	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
30F1 Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
30F2 Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
31A Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
31B2 Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
31C2 Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
38D1 Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
38F1: Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
51A1: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
51B2: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
51C2: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.
53: Providence	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
54: Kolin	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Moderate: wetness.	Moderate: wetness.
56A: Bude	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
69F:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lexington	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
70F:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lexington	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
72F1: Saffell	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
73D1: Lorman	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
73F1: Lorman	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, erodes easily.	Severe: slope.
78F:					
Lorman	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, erodes easily.	Severe: slope.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
78F:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
80. Riverwash					
94 Trebloc	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
95. Pits-Udorthents					

TABLE 13.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
5: Oaklimeter	Good	Good	Good	Good	Poor	Poor	Poor	Good	Good	Poor.
9: Bruno	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
10: Ariel	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
11: Collins	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
12: Bruno	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
13: Ochlockonee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
14: Gillsburg	Fair	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
23A: Cahaba	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
30B2: Memphis	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
30C2: Memphis	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
30F1: Memphis	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
30F2: Memphis	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
31A, 31B2: Loring	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
31C2: Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
38D1: Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
38F1: Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
51A1, 51B2: Providence	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
51C2, 53: Providence	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

TABLE 13.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
54----------------- Kolin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
56A---------------- Bude	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
69F:										
Smithdale---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lexington---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
70F:										
Smithdale---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lexington---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Memphis-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
72F1--------------- Saffell	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
73D1--------------- Lorman	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
73F1--------------- Lorman	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
78F:										
Lorman------------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Smithdale---------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
80. Riverwash										
94----------------- Trebloc	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
95. Pits-Udorthents										

TABLE 14.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
5 Oaklimeter	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.
9 Bruno	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
10 Ariel	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
11 Collins	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
12 Bruno	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
13 Ochlockonee	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
14 Gillsburg	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.
23A Cahaba	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
30B2 Memphis	Slight	Slight	Slight	Slight	Severe: low strength.	Slight.
30C2 Memphis	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
30F1, 30F2 Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
31A, 31B2 Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
31C2 Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
38D1 Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
38F1 Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

TABLE 14.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
51A1, 51B2 Providence	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
51C2, 53 Providence	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.
54 Kolin	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
56A Bude	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
69F:						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lexington	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
70F:						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lexington	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
72F1 Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
73D1 Lorman	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
73F1 Lorman	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
78F:						
Lorman	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
80. Riverwash						

TABLE 14.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
94----------------- Trebloc	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
95. Pits-Udorthents						

TABLE 15.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
5: Oaklimeter	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
9: Bruno	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
10: Ariel	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
11: Collins	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
12: Bruno	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
13: Ochlockonee	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
14: Gillsburg	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
23A: Cahaba	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
30B2, 30C2: Memphis	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
30F1, 30F2: Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
31A: Loring	Severe: wetness, percs slowly.	Slight	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
31B2, 31C2: Loring	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
38D1: Smithdale	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.

TABLE 15.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
38F1: Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
51A1, 51B2, 51C2, 53: Providence	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
54: Kolin	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
56A: Bude	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
69F:					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Lexington	Slight	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
70F:					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Lexington	Slight	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
Memphis	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
72F1: Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
73D1: Lorman	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
73F1: Lorman	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
78F:					
Lorman	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

TABLE 15.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
80. Riverwash					
94------------------ Trebloc	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, wetness.
95. Pits-Udorthents					

TABLE 16.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
5 Oaklimeter	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
9 Bruno	Good	Probable	Improbable: too sandy.	Poor: too sandy.
10 Ariel	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
11 Collins	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
12 Bruno	Good	Probable	Improbable: too sandy.	Poor: too sandy.
13 Ochlockonee	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
14 Gillsburg	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
23A Cahaba	Good	Probable	Improbable: too sandy.	Fair: too clayey.
30B2, 30C2 Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
30F1 Memphis	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
30F2 Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
31A, 31B2, 31C2 Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
38D1 Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
38F1 Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
51A1, 51B2, 51C2, 53 Providence	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
54 Kolin	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, too clayey.

TABLE 16.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
56A: Bude	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
69F:				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lexington	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
70F:				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lexington	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Memphis	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
72F1: Saffell	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
73D1: Lorman	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
73F1: Lorman	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
78F:				
Lorman	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
80. Riverwash				
94: Trebloc	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
95. Pits-Udorthents				

TABLE 17.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
5----------------- Oaklimeter	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding-------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
9----------------- Bruno	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty-------	Too sandy------	Droughty.
10---------------- Ariel	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Flooding-------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
11---------------- Collins	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Flooding-------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
12---------------- Bruno	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty-------	Too sandy------	Droughty.
13---------------- Ochlockonee	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Flooding-------	Favorable------	Favorable.
14---------------- Gillsburg	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Flooding-------	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
23A--------------- Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Favorable------	Favorable------	Favorable.
30B2, 30C2-------- Memphis	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
30F1, 30F2-------- Memphis	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
31A--------------- Loring	Moderate: seepage.	Moderate: piping, wetness.	Severe: no water.	Percs slowly---	Percs slowly, rooting depth, erodes easily.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.

TABLE 17.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
31B2, 31C2: Loring	Moderate: seepage, slope.	Moderate: piping, wetness.	Severe: no water.	Slope, percs slowly.	Percs slowly, rooting depth, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
38D1, 38F1: Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
51A1: Providence	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Severe: no water.	Favorable	Wetness, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
51B2, 51C2, 53: Providence	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Severe: no water.	Slope	Slope, wetness, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
54: Kolin	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
56A: Bude	Moderate: seepage.	Severe: wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
69F:							
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
Lexington	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
70F:							
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
Lexington	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.

TABLE 17.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
70F:							
Memphis	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
72F1 Saffell	Severe: seepage, slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Slope, droughty.	Slope, soil blowing.	Slope, droughty.
73D1, 73F1 Lorman	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
78F:							
Lorman	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
80. Riverwash							
94 Trebloc	Slight	Severe: wetness.	Severe: slow refill.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
95. Pits-Udorthents							

TABLE 18.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
5----------------- Oaklimeter	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-8
	6-27	Very fine sandy loam, silt loam, loam.	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	<30	NP-8
	27-62	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4	0	100	100	90-100	90-100	<30	NP-10
9---------------- Bruno	0-7	Sandy loam-------	SM, ML	A-4, A-2	0	100	100	60-85	30-60	<25	NP-3
	7-40	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2	0	100	100	60-80	10-30	---	NP
	40-60	Sand-------------	SP-SM, SM	A-2, A-3	0	100	100	50-70	5-20	---	NP
10--------------- Ariel	0-6	Silt loam--------	ML	A-4	0	100	100	90-100	85-95	<30	NP-7
	6-36	Silt loam, silt	ML, CL, CL-ML	A-4	0	100	100	90-100	90-100	<30	NP-10
	36-62	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	<30	NP-8
11--------------- Collins	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-100	70-90	<30	NP-8
	6-60	Silt loam, silt	ML, CL-ML	A-4	0	100	100	100	90-100	<35	NP-10
12--------------- Bruno	0-7	Sandy loam-------	SM, ML	A-4, A-2	0	100	100	60-85	30-60	<25	NP-3
	7-40	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2	0	100	100	60-80	10-30	---	NP
	40-62	Sand-------------	SP-SM, SM	A-2, A-3	0	100	100	50-70	5-20	---	NP
13--------------- Ochlockonee	0-5	Fine sandy loam	SM, ML, SC-SM, CL-ML	A-4, A-2	0	100	95-100	65-90	40-70	<26	NP-5
	5-53	Fine sandy loam, sandy loam, silt loam.	SM, ML, SC, CL	A-4	0	100	95-100	95-100	36-75	<32	NP-9
	53-65	Loamy sand, sandy loam, silt loam.	SM, ML, CL, SC	A-4, A-2	0	100	95-100	85-99	13-80	<32	NP-9
14--------------- Gillsburg	0-6	Silt loam--------	CL-ML, CL	A-4	0	100	100	100	95-100	20-28	5-10
	6-41	Silt, silt loam	CL-ML, CL	A-4	0	100	100	100	95-100	20-28	5-10
	41-64	Silt loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	20-33	5-16
23A-------------- Cahaba	0-8	Sandy loam-------	SM	A-4, A-2-4	0	95-100	95-100	65-90	30-45	---	NP
	8-43	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	0	90-100	80-100	75-90	40-75	22-35	8-15
	43-62	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2-4	0	95-100	90-100	60-85	10-35	---	NP
30B2------------- Memphis	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	6-34	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	34-80	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15

TABLE 18.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
30C2-------------- Memphis	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	6-30	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	30-72	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
30F1-------------- Memphis	0-8	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	8-36	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	36-72	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
30F2-------------- Memphis	0-4	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	4-36	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	36-72	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
31A--------------- Loring	0-8	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	8-20	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	20-68	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
31B2-------------- Loring	0-6	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	6-24	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	24-61	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
31C2-------------- Loring	0-6	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	6-26	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	26-72	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
38D1-------------- Smithdale	0-6	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	6-47	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	47-62	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
38F1-------------- Smithdale	0-15	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	15-37	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	37-72	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
51A1-------------- Providence	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	7-20	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	20-34	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	34-64	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18

TABLE 18.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
51B2------------- Providence	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	6-21	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	21-44	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	44-64	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
51C2------------- Providence	0-5	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	5-20	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	20-35	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	35-64	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
53--------------- Providence	0-5	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	5-22	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	22-40	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	40-64	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
54--------------- Kolin	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	60-85	<27	NP-7
	5-29	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	100	100	95-100	85-97	30-46	11-22
	29-62	Clay, silty clay	CH	A-7-6	0	100	100	90-100	75-95	50-63	25-35
56A-------------- Bude	0-5	Silt loam--------	CL	A-6	0	100	100	95-100	85-96	25-40	11-25
	5-19	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	84-98	35-50	15-30
	19-43	Silt loam, silty clay loam.	CL, CH	A-7, A-6	0	100	100	95-100	75-90	35-65	15-40
	43-63	Silty clay loam, clay loam, loam.	CL	A-6, A-4, A-7	0	100	100	95-100	75-90	25-48	8-22
69F:											
Smithdale-------	0-10	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	10-42	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	42-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
Lexington-------	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	70-100	25-42	5-16
	6-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-100	27-45	11-25
	31-80	Sandy loam, loam, silt loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	50-85	20-65	22-35	5-15

TABLE 18.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
70F:											
Smithdale-------	0-11	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	11-32	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	32-72	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
Lexington-------	0-12	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	70-100	25-42	5-16
	12-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-100	27-45	11-25
	36-62	Sandy loam, loam, silt loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	50-85	20-65	22-35	5-15
Memphis---------	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	6-29	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	29-80	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
72F1------------- Saffell	0-8	Gravelly sandy loam.	GM, GM-GC, GP-GM	A-1, A-2	0-10	25-60	25-50	20-45	12-35	<20	NP-5
	8-20	Very gravelly fine sandy loam, very gravelly sandy clay loam, very gravelly loam.	GC, SC, SC-SM, GM-GC	A-2, A-1, A-4	0-10	30-75	25-75	20-70	12-50	<30	NP-10
	25-50	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, GP-GC, GM-GC	A-2, A-1, A-4, A-6	0-10	25-55	25-50	20-50	12-40	20-40	4-15
	50-75	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-15	25-80	10-75	10-65	5-35	<30	NP-10
73D1------------- Lorman	0-3	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	20-35	5-15
	3-42	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	95-100	95-100	70-95	44-85	20-50
	42-64	Variable---------	---	---	---	---	---	---	---	---	---
73F1------------- Lorman	0-2	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	20-35	5-15
	2-53	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	95-100	95-100	90-95	44-85	20-50
	53-64	Variable---------	---	---	---	---	---	---	---	---	---
78F:											
Lorman----------	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	20-35	5-15
	5-45	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	95-100	95-100	90-95	44-85	20-50
	45-64	Variable---------	---	---	---	---	---	---	---	---	---
Smithdale-------	0-12	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	12-40	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	40-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10

TABLE 18.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
80. Riverwash											
94---------------- Trebloc	0-9	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	60-90	<30	NP-7
	9-21	Silt loam, silty clay loam, loam.	CL	A-4, A-6	0	100	100	85-100	85-100	25-40	8-16
	21-62	Silty clay loam, silty clay, silt loam.	CL	A-4, A-6, A-7	0	100	100	85-100	85-100	25-48	8-21
95. Pits-Udorthents											

TABLE 19.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
5----------------- Oaklimeter	0-6	10-16	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	5	.5-2
	6-27	7-18	1.40-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.43		
	27-62	7-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43		
9----------------- Bruno	0-7	3-10	1.40-1.55	6.0-20	0.10-0.15	5.1-8.4	Low-----------	0.17	5	.5-2
	7-40	2-8	1.40-1.60	6.0-20	0.05-0.10	5.1-8.4	Low-----------	0.15		
	40-60	2-8	1.40-1.60	6.0-20	0.02-0.05	5.1-8.4	Very low------	0.10		
10---------------- Ariel	0-6	12-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	5	.5-2
	6-36	7-27	1.45-1.70	0.2-0.6	0.14-0.23	4.5-5.5	Low-----------	0.43		
	36-62	12-35	1.45-1.70	0.2-0.6	0.14-0.23	4.5-5.5	Low-----------	0.43		
11---------------- Collins	0-6	7-16	1.40-1.50	0.6-2.0	0.16-0.24	4.5-5.5	Low-----------	0.43	5	.5-2
	6-60	5-18	1.40-1.50	0.6-2.0	0.20-0.24	4.5-5.5	Low-----------	0.43		
12---------------- Bruno	0-7	3-10	1.40-1.55	6.0-20	0.10-0.15	5.1-8.4	Low-----------	0.17	5	.5-2
	7-40	2-8	1.40-1.60	6.0-20	0.05-0.10	5.1-8.4	Low-----------	0.15		
	40-62	2-8	1.40-1.60	6.0-20	0.02-0.05	5.1-8.4	Very low------	0.10		
13---------------- Ochlockonee	0-5	3-18	1.40-1.60	2.0-6.0	0.07-0.14	4.5-6.5	Low-----------	0.20	5	.5-2
	5-53	8-18	1.40-1.60	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.20		
	53-65	3-18	1.40-1.70	2.0-6.0	0.06-0.12	4.5-5.5	Low-----------	0.17		
14---------------- Gillsburg	0-6	6-18	1.35-1.65	0.6-2.0	0.15-0.25	4.5-5.5	Low-----------	0.49	5	.5-3
	6-41	10-18	1.35-1.65	0.6-2.0	0.15-0.25	4.5-5.5	Low-----------	0.49		
	41-64	10-30	1.40-1.70	0.06-2.0	0.14-0.23	4.5-5.5	Low-----------	0.43		
23A--------------- Cahaba	0-8	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.24	5	.5-2
	8-43	18-35	1.35-1.60	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.28		
	43-62	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low-----------	0.24		
30B2-------------- Memphis	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
	6-34	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
	34-80	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
30C2-------------- Memphis	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
	6-30	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
	30-72	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
30F1-------------- Memphis	0-8	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
	8-36	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
	36-72	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
30F2-------------- Memphis	0-4	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
	4-36	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
	36-72	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
31A--------------- Loring	0-8	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
	8-20	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	20-68	15-30	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low-----------	0.43		
31B2-------------- Loring	0-6	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
	6-24	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	24-61	15-30	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low-----------	0.43		

TABLE 19.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
31C2-------------Loring	0-6	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.49	3	.5-2
	6-26	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	26-72	15-30	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low----------	0.43		
38D1-------------Smithdale	0-6	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	6-47	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	47-62	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
38F1-------------Smithdale	0-15	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	15-37	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	37-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
51A1-------------Providence	0-7	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.49	3	.5-3
	7-20	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	20-34	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
	34-64	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
51B2-------------Providence	0-6	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.49	3	.5-3
	6-21	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	21-44	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
	44-64	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
51C2-------------Providence	0-5	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.49	3	.5-3
	5-20	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	20-35	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
	35-64	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
53---------------Providence	0-5	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.49	3	.5-3
	5-22	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	22-40	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
	40-64	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low----------	0.32		
54---------------Kolin	0-5	10-27	1.35-1.65	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.49	5	.5-4
	5-29	20-35	1.35-1.65	0.2-0.6	0.18-0.22	4.5-6.0	Moderate-----	0.37		
	29-62	40-55	1.20-1.50	<0.06	0.15-0.18	4.5-8.4	High---------	0.32		
56A--------------Bude	0-5	10-27	1.40-1.60	0.6-2.0	0.21-0.24	4.5-6.0	Low----------	0.49	3	.5-2
	5-19	10-32	1.40-1.65	0.06-0.2	0.14-0.23	4.5-6.0	Moderate-----	0.43		
	19-43	16-32	1.40-1.65	0.06-0.2	0.11-0.23	4.5-6.0	Moderate-----	0.37		
	43-63	18-33	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.37		
69F:										
Smithdale-------	0-10	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	10-42	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Lexington-------	0-6	12-27	1.30-1.50	0.6-2.0	0.17-0.22	4.5-6.0	Low----------	0.49	3	.5-2
	6-31	20-33	1.40-1.55	0.6-2.0	0.16-0.21	4.5-6.0	Low----------	0.43		
	31-80	15-29	1.30-1.50	2.0-6.0	0.06-0.12	4.5-6.0	Low----------	0.24		
70F:										
Smithdale-------	0-11	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	11-32	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	32-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Lexington-------	0-12	12-27	1.30-1.50	0.6-2.0	0.17-0.22	4.5-6.0	Low----------	0.49	3	.5-2
	12-36	20-33	1.40-1.55	0.6-2.0	0.16-0.21	4.5-6.0	Low----------	0.43		
	36-62	15-29	1.30-1.50	2.0-6.0	0.06-0.12	4.5-6.0	Low----------	0.24		

TABLE 19.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
70F:										
Memphis----------	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
	6-29	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
	29-80	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
72F1-------------- Saffell	0-8	5-15	1.35-1.60	2.0-6.0	0.05-0.13	4.5-5.5	Low-----------	0.15	4	1-2
	8-20	10-27	1.35-1.60	0.6-2.0	0.06-0.15	4.5-5.5	Low-----------	0.28		
	20-50	12-35	1.35-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low-----------	0.28		
	50-75	8-25	1.40-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low-----------	0.17		
73D1-------------- Lorman	0-3	10-27	1.30-1.65	0.6-2.0	0.20-0.22	4.5-6.5	Low-----------	0.43	4	.5-1
	3-42	35-55	1.20-1.50	<0.06	0.16-0.20	4.5-7.8	Very high-----	0.32		
	42-64	---	---	---	---	---	--------------	----		
73F1-------------- Lorman	0-2	10-27	1.30-1.65	0.6-2.0	0.20-0.22	4.5-6.5	Low-----------	0.43	4	.5-1
	2-53	35-55	1.20-1.50	<0.06	0.16-0.20	4.5-7.8	Very high-----	0.32		
	53-64	---	---	---	---	---	--------------	----		
78F:										
Lorman-----------	0-5	10-27	1.30-1.65	0.6-2.0	0.20-0.22	4.5-6.5	Low-----------	0.43	4	.5-1
	5-45	35-55	1.20-1.50	<0.06	0.16-0.20	4.5-7.8	Very high-----	0.32		
	45-64	---	---	---	---	---	--------------	----		
Smithdale--------	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	12-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	40-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
80. Riverwash										
94---------------- Trebloc	0-9	5-20	1.40-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.43	5	1-3
	9-21	20-35	1.45-1.55	0.2-0.6	0.15-0.20	4.5-5.5	Moderate------	0.37		
	21-62	20-45	1.45-1.55	0.2-0.6	0.14-0.18	4.5-5.5	Moderate------	0.37		
95. Pits-Udorthents										

TABLE 20.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "occasional," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
5----------------- Oaklimeter	C	Occasional	Brief to very long.	Nov-Apr	1.5-2.5	Apparent	Nov-Mar	Moderate	High.
9----------------- Bruno	A	Frequent----	Brief-----	Dec-Jun	4.0-6.0	Apparent	Dec-Apr	Low------	Low.
10---------------- Ariel	C	Occasional	Brief-----	Jan-Apr	2.5-4.0	Apparent	Jan-Apr	Low-----	Moderate.
11---------------- Collins	C	Occasional	Brief to very long.	Jan-Apr	2.0-5.0	Apparent	Jan-Apr	Moderate	Moderate.
12---------------- Bruno	A	Occasional	Brief-----	Dec-Jun	4.0-6.0	Apparent	Dec-Apr	Low------	Low.
13---------------- Ochlockonee	B	Occasional	Very brief	Dec-Apr	3.0-5.0	Apparent	Dec-Apr	Low------	High.
14---------------- Gillsburg	D	Occasional	Brief to very long.	Dec-Apr	1.0-2.0	Apparent	Dec-Apr	High-----	High.
23A--------------- Cahaba	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.
30B2, 30C2, 30F1, 30F2------------- Memphis	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.
31A, 31B2, 31C2--- Loring	C	None--------	---	---	2.0-3.0	Perched	Dec-Mar	Moderate	Moderate.
38D1, 38F1-------- Smithdale	B	None--------	---	---	>6.0	---	---	Low------	Moderate.
51A1, 51B2, 51C2, 53--------------- Providence	C	None--------	---	---	1.5-3.0	Perched	Jan-Mar	Moderate	Moderate.
54---------------- Kolin	C	None--------	---	---	1.5-3.0	Perched	Dec-Apr	High----	Moderate.
56A--------------- Bude	C	None--------	---	---	0.5-1.5	Perched	Jan-Apr	High----	High.
69F: Smithdale--------	B	None--------	---	---	>6.0	---	---	Low------	Moderate.
Lexington--------	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.

TABLE 20.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
70F:									
Smithdale	B	None	---	---	>6.0	---	---	Low	Moderate.
Lexington	B	None	---	---	>6.0	---	---	Moderate	Moderate.
Memphis	B	None	---	---	>6.0	---	---	Moderate	Moderate.
72F1 Saffell	B	None	---	---	>6.0	---	---	Low	Moderate.
73D1, 73F1 Lorman	D	None	---	---	>6.0	---	---	High	Moderate.
78F:									
Lorman	D	None	---	---	>6.0	---	---	High	Moderate.
Smithdale	B	None	---	---	>6.0	---	---	Low	Moderate.
80. Riverwash									
94 Trebloc	D	Frequent	Very brief	Jan-Apr	0.5-1.0	Apparent	Jan-Apr	High	High.
95. Pits-Udorthents									

TABLE 21.--PHYSICAL AND CHEMICAL ANALYSES OF SELECTED SOILS

(Analyses by the Soil Genesis and Morphology Laboratory, Mississippi Agricultural and Forestry Experiment Station. The pedons are typical of the series in the survey area. For a description of the soils and their location, see the section "Soil Series and Their Morphology")

Soil name and sample number	Horizon	Depth	Particle-size distribution: Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Extractable bases: Ca	Mg	K	Na	Extractable acidity	Sum of cations	Base saturation	Reaction 1:1 soil:water	Organic matter
		In	Pct	Pct	Pct	Milliequivalents/100 grams of soil						Pct	pH	Pct
Bude silt loam: S84MS-037-03	Ap	0-5	24.3	61.3	14.4	8.07	1.41	0.09	0.32	8.45	18.34	53.9	5.7	3.7
	Bw1	5-11	14.6	59.7	25.7	1.60	1.35	0.07	0.32	11.66	15.00	22.3	4.7	0.3
	Bw2	11-19	11.2	60.0	28.8	1.32	1.59	0.08	0.39	10.55	13.93	24.3	4.8	0.3
	B/E	19-24	12.3	62.5	25.2	1.01	1.42	0.09	0.35	11.02	13.89	20.7	4.6	0.3
	Btx1	24-43	15.0	64.4	20.6	0.12	4.43	0.10	0.66	11.33	13.64	16.9	5.1	0.1
	2Btx2	43-63	38.9	48.5	12.6	0.02	6.42	0.06	0.83	5.08	12.41	59.1	5.0	0.1
Lorman silt loam: S84MS-037-01	A	0-2	17.6	65.9	16.5	15.83	4.75	0.46	0.24	23.06	44.34	47.9	4.9	14.3
	AB	2-5	16.4	53.3	30.3	14.21	7.24	0.46	0.19	13.46	35.56	62.1	4.6	3.7
	Bt1	5-10	9.6	38.2	52.2	19.11	11.75	0.53	0.25	13.94	45.58	69.4	4.5	0.9
	Bt2	10-16	13.6	40.5	45.9	16.65	9.96	0.45	0.23	16.62	43.91	62.1	4.5	0.5
	Bt3	16-27	14.6	53.2	32.2	12.36	7.24	0.33	0.25	15.08	35.26	57.2	4.6	0.2
	Bt4	27-33	10.9	51.1	38.0	15.08	9.10	0.34	0.40	13.66	38.58	64.6	4.5	0.1
	BC	33-53	18.1	44.7	37.2	16.91	9.28	0.28	0.61	6.37	33.45	80.9	4.7	0.2
	C	53-63	24.9	69.8	5.3	16.89	8.73	0.28	0.64	6.26	32.80	80.9	4.8	0.2

TABLE 22.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Ariel	Coarse-silty, mixed, thermic Fluventic Dystrochrepts
Bruno	Sandy, mixed, thermic Typic Udifluvents
Bude	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Collins	Coarse-silty, mixed, acid, thermic Aquic Udifluvents
Gillsburg	Coarse-silty, mixed, acid, thermic Aeric Fluvaquents
Kolin	Fine-silty, siliceous, thermic Glossaquic Paleudalfs
Lexington	Fine-silty, mixed, thermic Typic Paleudalfs
Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
Lorman	Fine, montmorillonitic, thermic Vertic Hapludalfs
Memphis	Fine-silty, mixed, thermic Typic Hapludalfs
Oaklimeter	Coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Providence	Fine-silty, mixed, thermic Typic Fragiudalfs
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
Trebloc	Fine-silty, siliceous, thermic Typic Paleaquults
Udorthents	Typic Udorthents

TABLE 23.--GEOLOGY OF FRANKLIN COUNTY

System	Series	Stratigraphic unit	Approximate maximum thickness (feet)	Lithologic character
Quaternary	Recent	Alluvium	5-50	Sand, light brownish gray to medium dark gray, very fine grained to very coarse grained, silty, clayey; commonly contains organic matter, chert, quartzite, and quartz pebbles at base
	Pleistocene	Loess	0-20	Silt, pale yellowish brown to light brownish gray; massive appearance in outcrop; occurs as a thin mantle throughout the western part of the county and becomes thinner toward the eastern part
		Pre-loess terrace deposits	60	Sand, dark reddish brown to light brownish gray, fine grained to very coarse grained, cross-bedded; frequent thin beds and lenses of gravel, chert, and quartz, well rounded, cross-bedded
		Citronelle Formation	90	Sand, moderate reddish brown to very light gray, fine grained to very coarse grained, cross-bedded; gravel, chert, and quartz, very well rounded pebbles in a sand matrix, cross-bedded; clay, medium gray to dark reddish brown; occurs as lenses and thin, discontinuous beds; red hue imparted to sediments upon weathering; unconformity at base
Tertiary	Miocene	Pascagoula Formation	400	Clay, light bluish gray to dark greenish gray, silty, sandy, locally indurated; sand, light gray, fine grained or medium grained, micaceous, sparingly glauconitic, locally indurated; red hue imparted to sediments upon weathering
		Hattiesburg Formation	400-450	Clay, light bluish gray to light gray, sandy, silty, locally indurated; sand, light gray, very fine grained to coarse grained, micaceous, sparingly glauconitic, horizontal and cross-bedded; locally indurated; red hue imparted to sediments upon weathering

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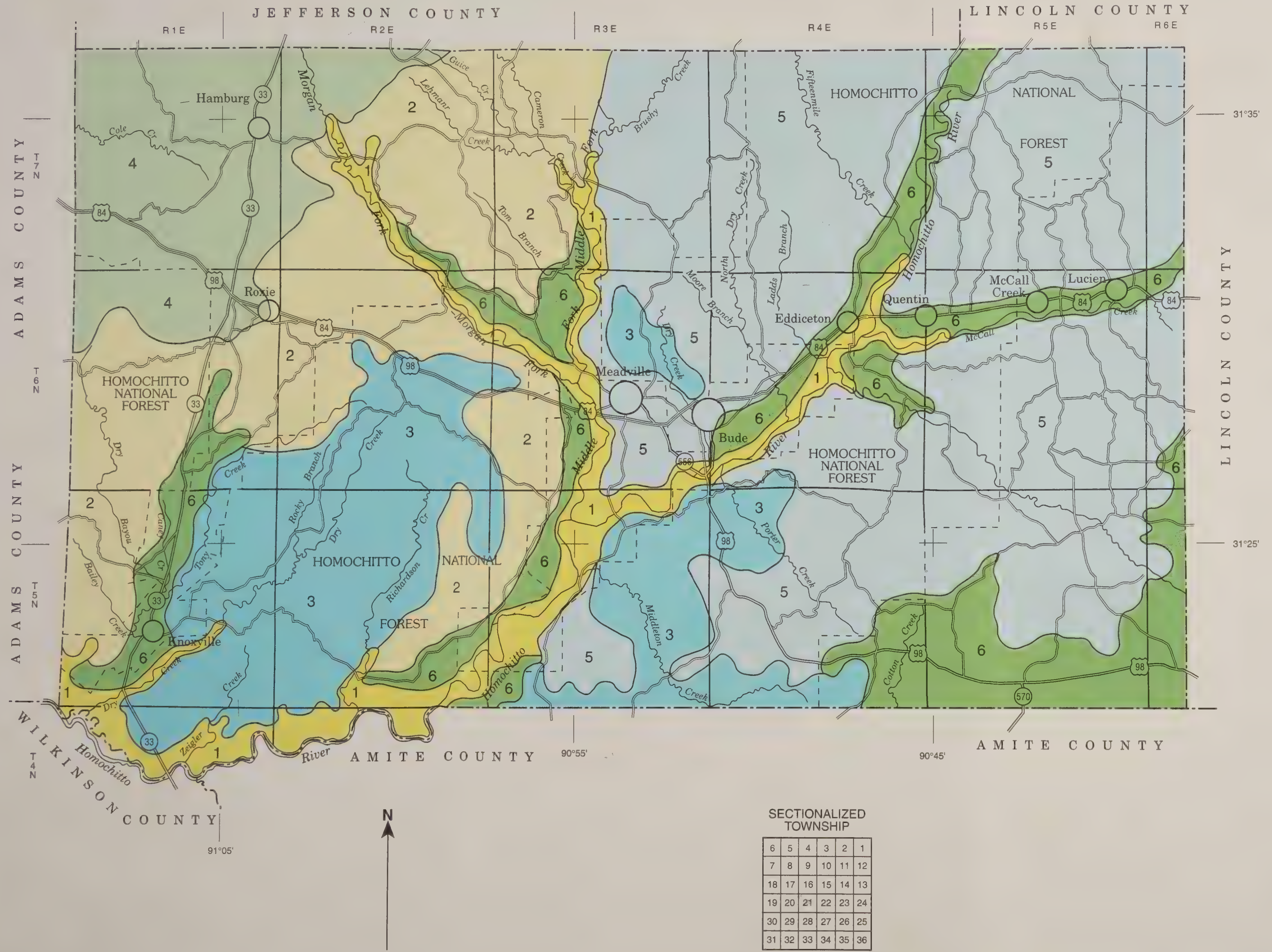


SOIL LEGEND*

1 GILLSBURG-ARIEL-OAKLIMETER
2 SMITHDALE-LORING
3 LORMAN-SMITHDALE
4 SMITHDALE-LEXINGTON-MEMPHIS
5 SMITHDALE-PROVIDENCE-SAFFELL
6 PROVIDENCE-BUDE-SMITHDALE

* The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1994

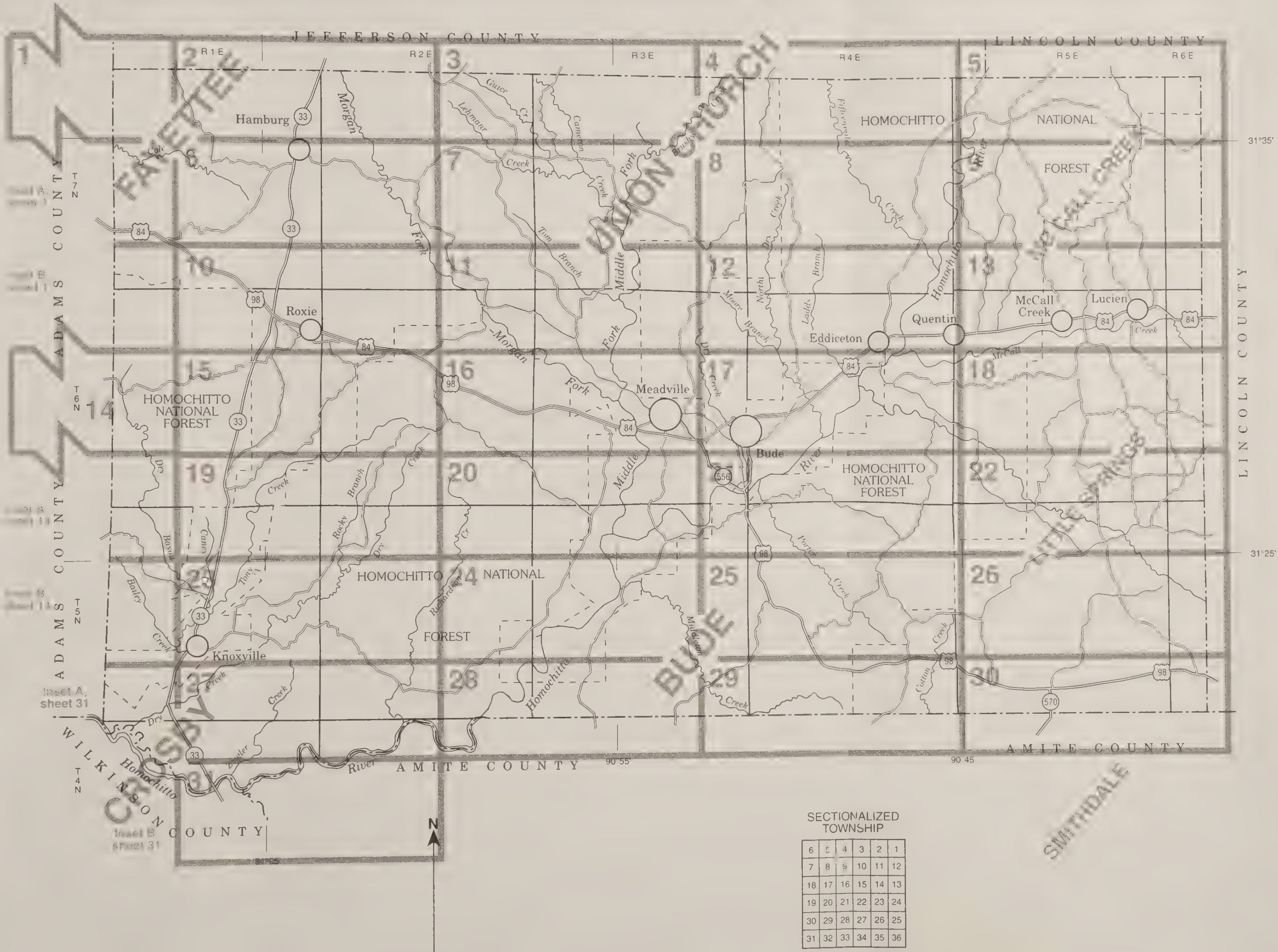
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
FOREST SERVICE
MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION

GENERAL SOIL MAP

FRANKLIN COUNTY, MISSISSIPPI

Scale 1:190,080

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

FRANKLIN COUNTY, MISSISSIPPI

Scale 1:190,080

Miles

Km

SOIL LEGEND

Symbols consist of numbers or a combination of numbers and letters. A number consisting of one or two digits represents the kind of soil. In some units the number is followed by a capital letter that represents the slope and a final number of 1, 2, or 3 that indicates the amount of erosion. The number 1 indicates slight erosion, a 2 indicates moderate erosion, and a 3 indicates severe erosion. Symbols without a slope symbol represent nearly level soils on flood plains, miscellaneous land areas, or map units with broader slope classes.

SYMBOL	NAME
5	Oaklimeter silt loam, occasionally flooded
9	Bruno sandy loam, frequently flooded
10	Ariel silt loam, occasionally flooded
11	Collins silt loam, occasionally flooded
12	Bruno sandy loam, occasionally flooded
13	Ochlockonee fine sandy loam, occasionally flooded
14	Gillsburg silt loam, occasionally flooded
23A	Cahaba sandy loam, 0 to 3 percent slopes
30B2	Memphis silt loam, 2 to 5 percent slopes, eroded
30C2	Memphis silt loam, 5 to 8 percent slopes, eroded
30F1	Memphis silt loam, 15 to 35 percent slopes
30F2	Memphis silt loam, 8 to 45 percent slopes, eroded
31A	Loring silt loam, 0 to 2 percent slopes
31B2	Loring silt loam, 2 to 5 percent slopes, eroded
31C2	Loring silt loam, 5 to 8 percent slopes, eroded
38D1	Smithdale sandy loam, 8 to 15 percent slopes
38F1	Smithdale sandy loam, 15 to 40 percent slopes
51A1	Providence silt loam, 0 to 2 percent slopes
51B2	Providence silt loam, 2 to 5 percent slopes, eroded
51C2	Providence silt loam, 5 to 8 percent slopes, eroded
53	Providence silt loam, 2 to 8 percent slopes, eroded
54	Kolin silt loam, 2 to 8 percent slopes, eroded
56A	Bude silt loam, 0 to 2 percent slopes
69F	Smithdale-Lexington association, 5 to 40 percent slopes*
70F	Smithdale-Lexington-Memphis association, 5 to 40 percent slopes*
72F1	Saffell gravelly sandy loam, 15 to 40 percent slopes
73D1	Lorman silt loam, 8 to 15 percent slopes
73F1	Lorman silt loam, 15 to 35 percent slopes
78F	Lorman and Smithdale soils, 15 to 35 percent slopes*
80	Riverwash
94	Trebloc silt loam, frequently flooded
95	Pits-Udorthents complex

* The composition of these units is more variable than that of others in the survey area but mapping has been controlled well enough to be interpreted for the expected use of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label) — Davis Airstrip

Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 173
- Federal — 287
- State — 52
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE
(normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small (Named where applicable) — water

PITS — w

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban area) (occupied)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — 14, 11

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

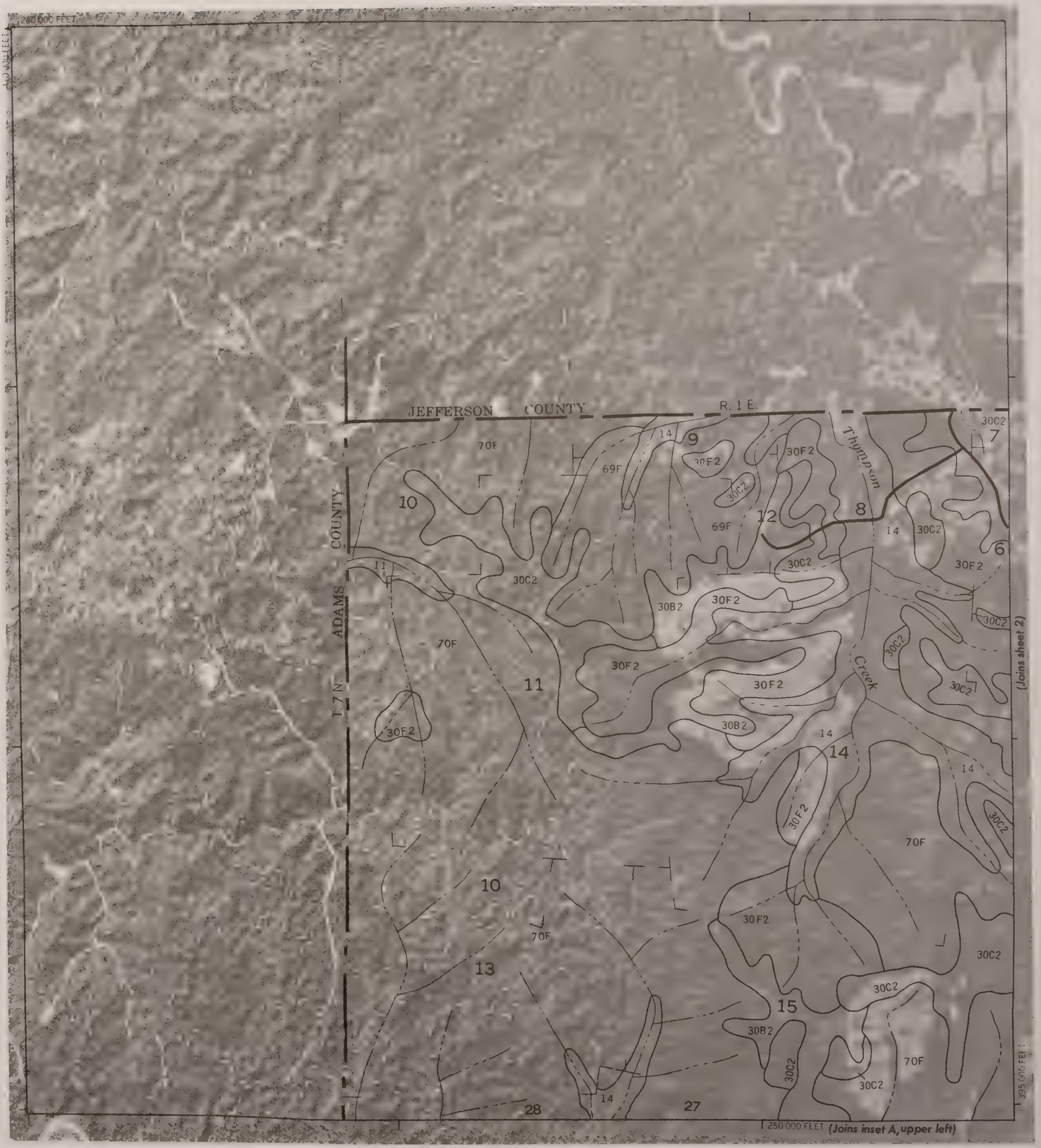
DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

N



1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

SCALE 1:20 000


JEFFERSON COUNTY
R. 2 E. R. 3 E.
Cameron
Branch
Middle Fork
Homochitto
Creek
SCALE 1:20 000
1 MILE
1 KILOMETER
N

FRANKLIN COUNTY, MISSISSIPPI — SHEET NUMBER 4


N
JEFFERSON COUNTY
LINCOLN COUNTY
R.5E. | R.6E.
T.7N.
HOMOCHITTO RIVER
HOMOCHITTO NATIONAL FOREST
Shucktown
Kennolia
Blue Creek
Mollis Creek
Horse Creek
(Joins sheet 4)
1 MILE
1 KILOMETER
SCALE 1:20 000

N

FRANKLIN COUNTY, MISSISSIPPI — SHEET NUMBER 6

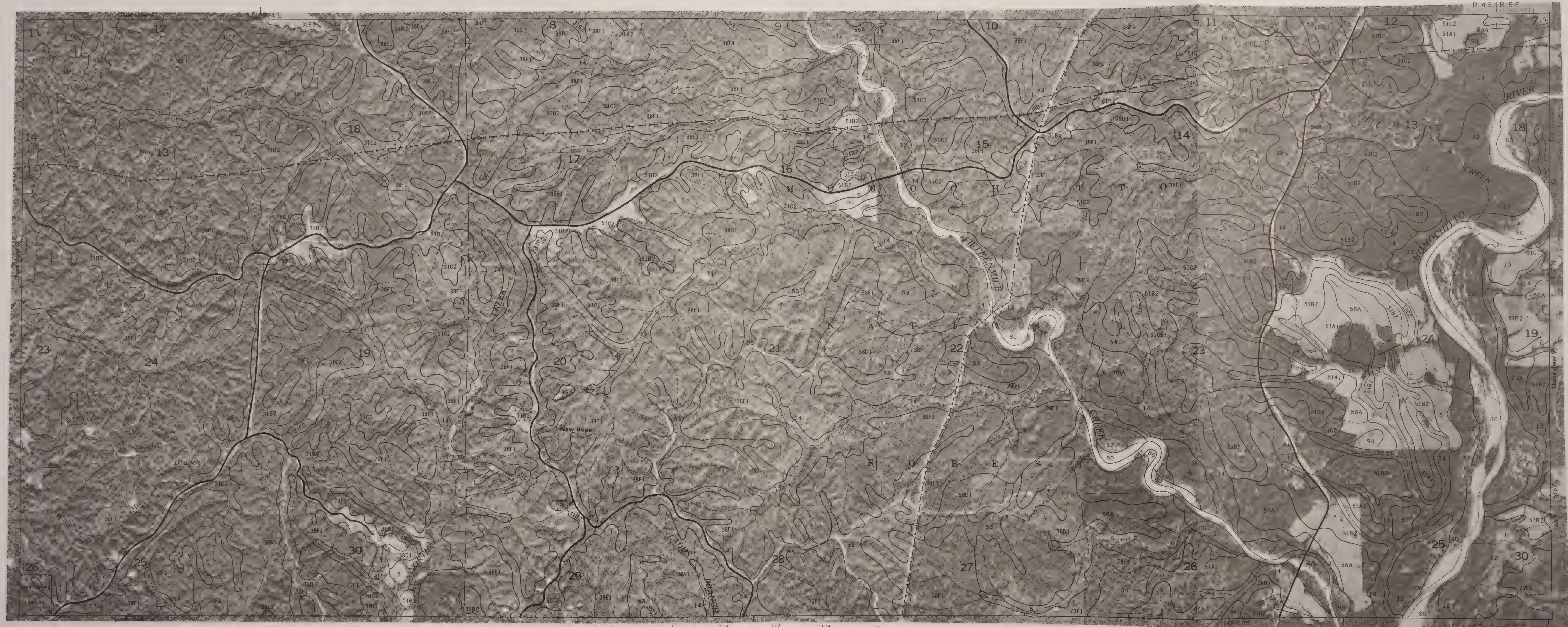
1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

7
N
Oldenburg
HOMOCHITTO
BRUSHY CREEK
HOMOCHITTO NATIONAL FOREST
SCALE 1:20 000
1 MILE
1 KILOMETER

N



1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000


N
HOMOCHITTO RIVER
H O M O C H I T T O
N A T I O N A L
F O R E S T
R. 5 E. | R. 6 E.
T. 7 N.
(Joins sheet 8)
(Joins sheet 13)
(Joins sheet 5)
1 MILE
1 KILOMETER
SCALE 1:20 000

N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

N

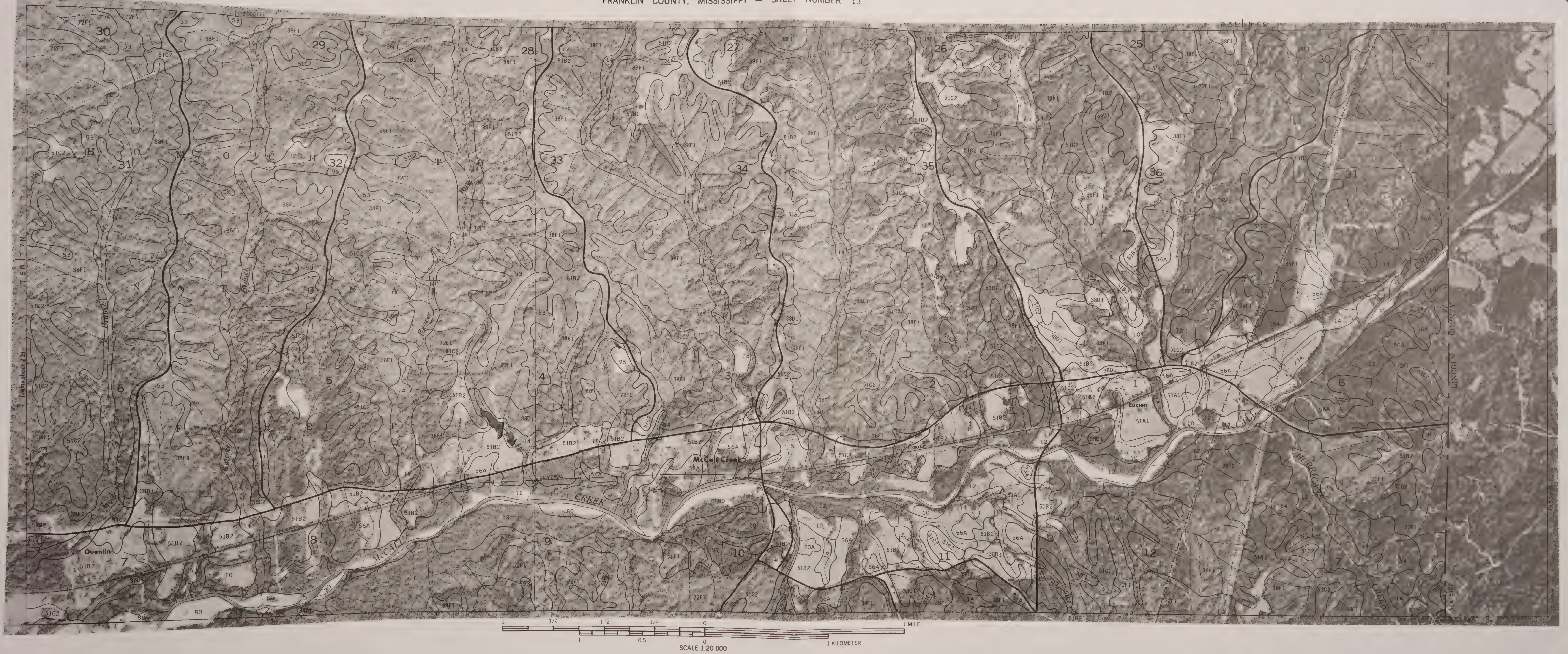
1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

FRANKLIN COUNTY, MISSISSIPPI — SHEET NUMBER 12

SCALE 1:20 000


N
Lucien
McCall Creek
Quentin
LINCOLN COUNTY
HOMOCHITTO NATIONAL FOREST
McCALL CREEK
1 MILE
1 KILOMETER
SCALE 1:20 000

N

FRANKLIN COUNTY, MISSISSIPPI — SHEET NUMBER 14

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

15

N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000


N
R.2 E. | R.3 E.
HOMOCHITTO NATIONAL FOREST
MIDDLE FORK
MORGAN FORK
HOMOCHITTO RIVER
MEADVILLE
(county seat)
Owen Creek
Mills Branch
(Joins sheet 15)
(Joins sheet 17)
(Joins sheet 20)
1 MILE
1 KILOMETER
SCALE 1:20 000


HOMOCHITTO
NATIONAL
FOREST
MEADVILLE
(county seat)
Monroe
BUDE
Eddiceton
HOMOCHITTO
RIVER
McGEHEE CREEK
McCALL CREEK
DRY CREEK
NORTH BRANCH
SCALE 1:20 000
1 MILE
1 KILOMETER


N
(Joins sheet 33)
McCALL CREEK
HOMOCHITTO
NATIONAL
FOREST
McCall
McGEHEE
CREEK
HORSE
CREEK
LINCOLN COUNTY
(Joins sheet 22)
1 MILE
1 KILOMETER
SCALE 1:20 000


HOMOCHITTO
NATIONAL
FOREST
H O M O C H I T T O
N A T I O N A L
F O R E S T
White Apple
Franklin
R 1 E | R 2 E
SCALE 1:20 000
1 MILE
1 KILOMETER

FRANKLIN COUNTY, MISSISSIPPI — SHEET NUMBER 20


21
N
BUDE
HOMOCHITTO
RIVER
HOMOCHITTO NATIONAL FOREST
PORTER CREEK
Wilkinson Branch
Landing Strip
1 MILE
1 KILOMETER
SCALE 1:20 000

N


(Joins sheet 18)
(Joins sheet 26)
R.5E. R.6E.
HOMOCHITTO
NATIONAL
FOREST
HORSE
CREEK
BRANCH
McGEHEE
MILL
LINCOLN COUNTY
1 MILE
1 KILOMETER
SCALE 1:20 000

1 MILE
1 KILOMETER
SCALE 1:20 000

24

N


HOMOCHITTO
NATIONAL
FOREST
HOMOCHITTO
RIVER
R 2 E | R 3 E
SCALE 1:20 000
1 MILE
1 KILOMETER

N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000


N
(Joins sheet 29)
(Joins sheet 30)
Little Springs
Nettles
COOPER CREEK
CREEK
1 MILE
1 KILOMETER
SCALE 1:20 000

SCALE 1:20 000
1 MILE
1 KILOMETER

28

N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

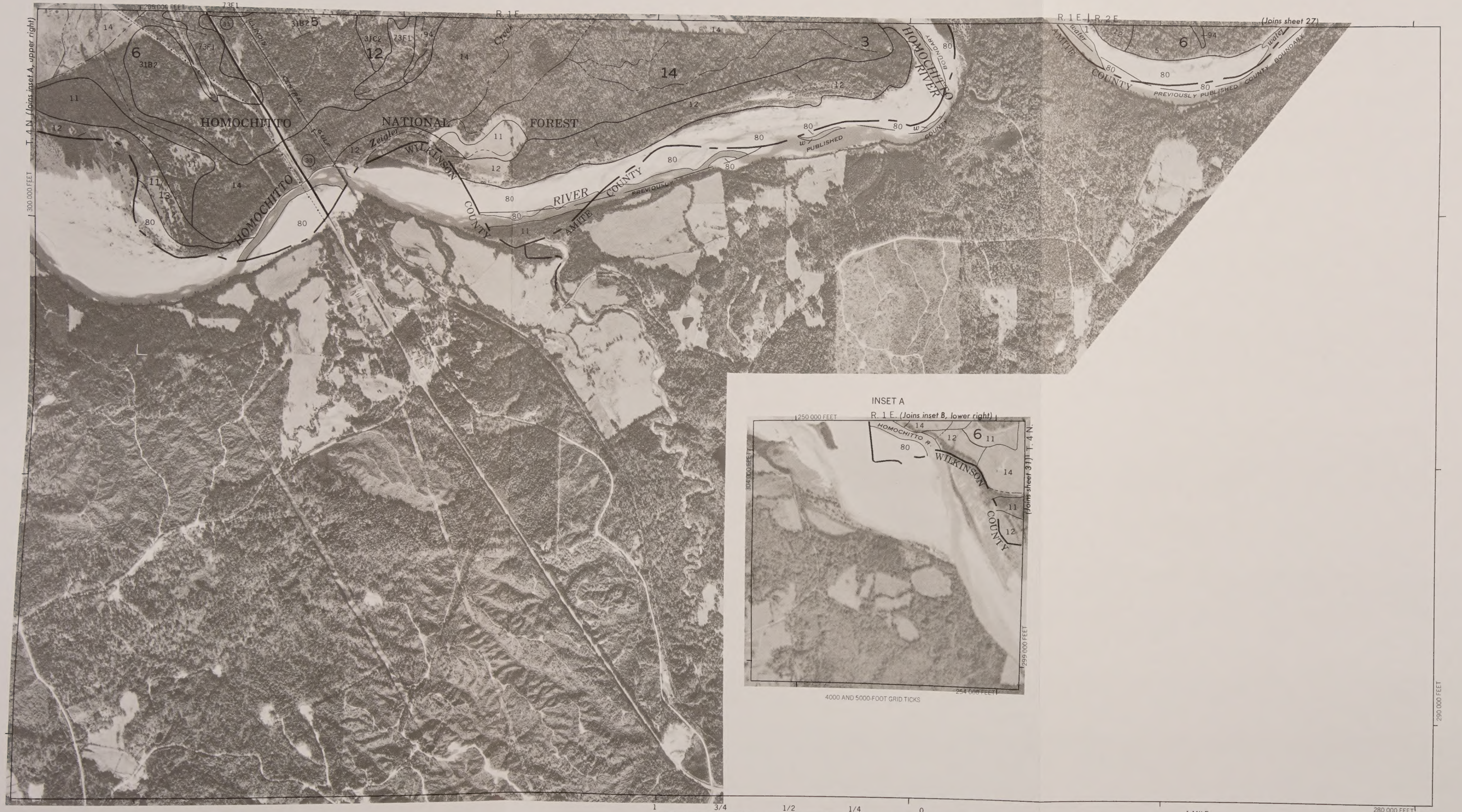
SCALE 1:20 000

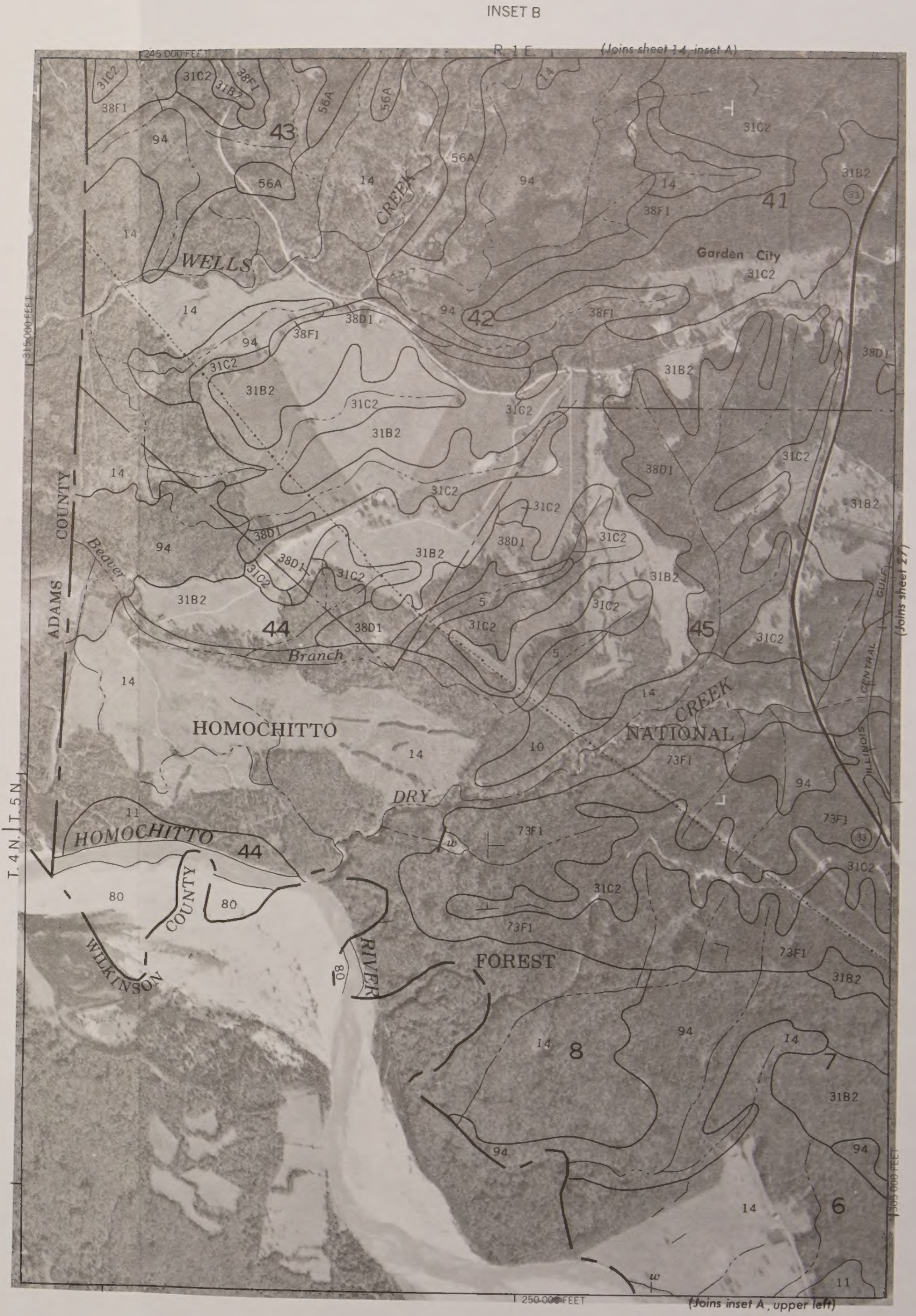
N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000





SCALE 1:20 000

1 MILE

1 KILOMETER